DOCUMENT RESUME

ED 255 433 SO 016 320

AUTHOR	Kaplan, Charles P.; Van Valey, Thomas L.
TITLE	Census '80: Continuing the Factfinder Tradition.
INSTITUTION	Bureau of the Census (DOC), Washington, D.C. Data User Services Div.
PUB DATE	Jan 80
NOTE	495p.; For "Census '80: Projects for Students," see ED 209 169. Some tables, maps, and illustrations contain small print that may not reproduce clearly.
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (Stock No. 003-024-0226-1, $9.00).
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF02/PC20 Plus Postage.
DESCRIPTORS	Business; Case Studies; *Census Figures; Data Analysis; Demography; Geography; Higher Education; Information Services; Instructional Materials; Primary Sources; Regional Planning; Resource Materials; *Skill Development; *Social Studies; Textbooks; United States History; Urban Planning

ABSTRACT

This publication was prepared to help college students better understand the significance of the 1980 census. It consists of four parts. Part I discusses the history of U.S. census taking, introduces the Census Bureau as an organization, and examines the planning and administration of the decennial census. Part II provides an overview of census geography, discusses data analysis, and examines the field of demography. Part III provides an overview of the 1980 census, including the census plan, collection and tabulation, and products and services. Part IV, mostly through case studies, shows how census data can be used by urban and regional planners, business people, geographers, and social demographers. Appendices contain data on population and housing items on general schedules (1790-1970); lists of departments and officials responsible for the U.S. Censuses (1790-1980); background information on Census Bureau surveys and on the 1985 mid-decade census; a discussion of parts of a statistical table; the publication, "Your Guide to Census '80;" and the 1980 census questionnaire. (RM)

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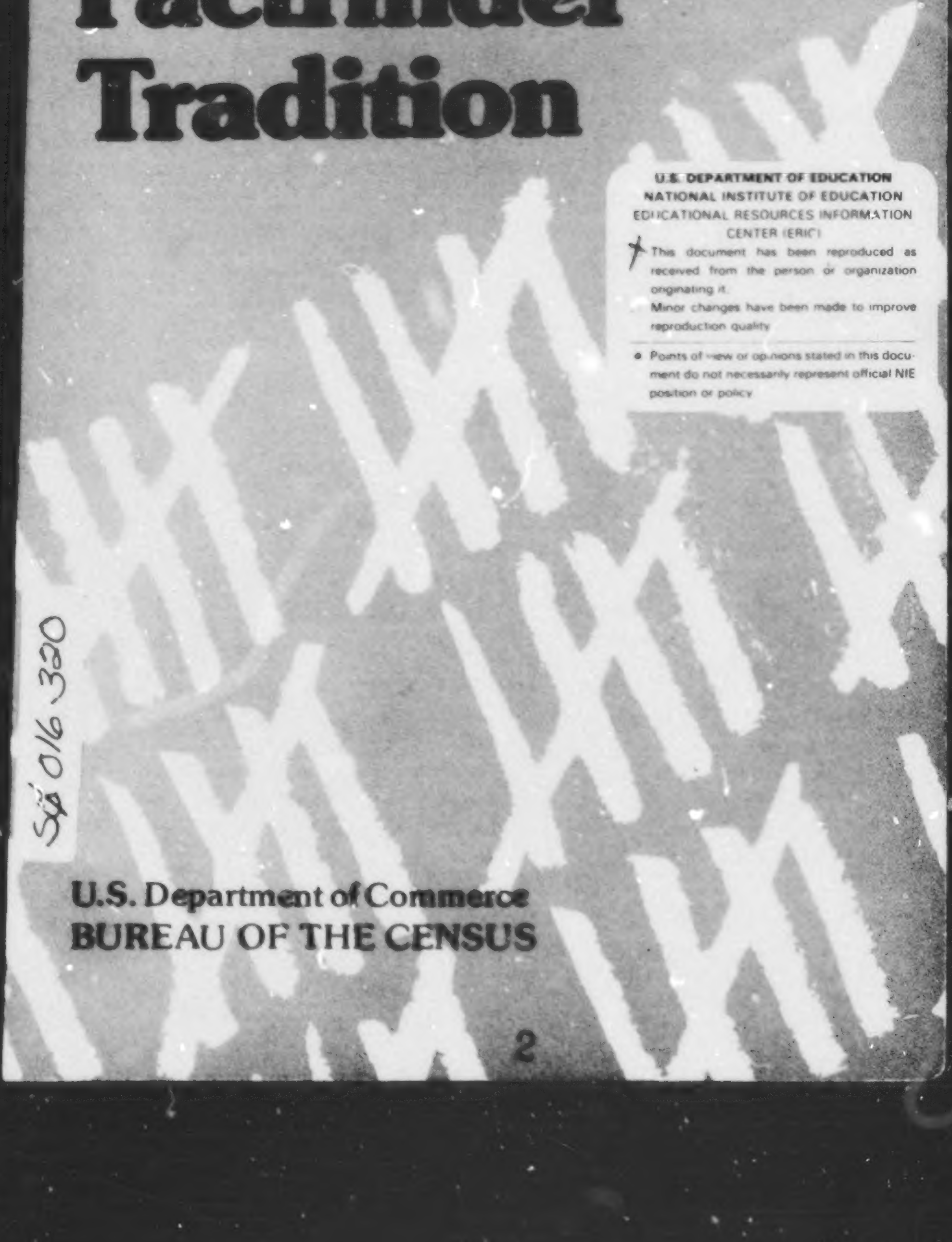

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CENSUS '80:
Continuing the Factfinder Tradition

By

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This textbook has been prepared for use by universities participating in one of the Census Bureau's experimental programs for the 1980 census. Comments regarding its format, organization, and content are appreciated to aid in the preparation of a second edition, which will be designed for wider distribution.

Issued January 1980

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Library of Congress Card
No. 80-600007

Suggested Citation
U.S. Bureau of the Census
CENSUS '80: CONTINUING THE FACTFINDER TRADITION by
Charles P. Kaplan, Thomas Van Valey
and Associates

For sale by Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock No. 003-024-02262-1

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PREFACE

The 1980 decennial census, which begins April 1, will mark the 20th time in the Nation's history that Americans have counted themselves. The number of questions and the uses of census data have both grown considerably since the first count, and quill pens have yielded to computers, but the census has never lost its roots in the Constitution. When the delegates to the Constitutional Convention met in 1787, they decided that population distribution should be the basis for direct taxation and for apportionment in the House of Representatives so they approved a Constitutional requirement that every person in the Nation be counted at least once every 10 years, beginning in 1790. For nearly two centuries since then, the decennial census has monitored the growth and development of the Nation, yielding invaluable information about ourselves as a people: Who we are, what we do, how we live. Taken together, these 10-year assessments of the developing republic form the backbone of our history.

Precision in counting the population has always been a prime objective of the census, but for the 1980 census a count that is as accurate and complete as possible has been given top priority. Work in this direction began shortly after the 1970 census and embraces a wide range of activities aimed toward improving census coverage. The estimate of undercoverage from the 1970 decennial censuses was 2.5 percent. Though this level of undercoverage is significant, it might not be of as much concern if coverage losses occurred randomly and were distributed equally by geographic area. Evaluations of the undercoverage, however, indicate that it is disproportionate by population group and geographic area.

This coverage differential is important for many reasons. The primary purpose of the census is to provide population counts for reapportionment in the House of Representatives. Differential coverage errors could lead to an inequitable determination of representatives by State. Further, the decennial census is a prime source of small area data, so coverage differentials can be quite meaningful when considering data for small geographic areas. Finally, there is increasing use of census data to allocate Federal funds to local governments. Differential coverage could have an important effect on such allocations.

The goal of coverage improvement in the 1980 census is two-pronged: (1) To improve the census-taking process and attain a relatively low overall undercoverage rate, and (2) to reduce the coverage differential. There are two main approaches the Census Bureau is using to achieve these goals. The first includes special publicity efforts to *make people more aware* of the census; to explain the uses of census data to encourage response; and to make people aware of the confidential nature of their response. This program has special emphasis for minority groups. These attempts are extremely important because the 1980 census will be largely self-reporting. The second approach is to develop and *improve the census-taking procedures* to reduce the possibility of people and households being missed.

Achievement of the coverage goal requires the recruitment, training, and supervision of over 200,000 temporary census enumerators to locate both households and persons missed during the self-reporting process. However, enumerator recruitment has emerged as a serious problem for the Census Bureau, a problem further complicated by the high turnover rate among enumerators in certain areas.

To evaluate alternative approaches to enumerator recruitment and retention, the Census Bureau initiated the Experimental Student Intern Program (ESIP) for the 1980 census. Approximately 50 colleges and universities were invited to participate in the ESIP during the winter and spring of 1980.The major purpose of the ESIP is to assess the enumerator employment potential of students, while contributing to the census-related education programs sponsored by colleges and universities. Students participating in the ESIP are, minimally, enrolled in an internship course within their institutions for which they are to receive academic credit upon completion of both course work and an enumerator assignment. It is expected that the ESIP students will become more aware of the history and purposes of census taking, the kinds of information that are gathered, and how the information is eventually made available for use.

CENSUS '80: Continuing the Factfinder Tradition was prepared for students participating in the ESIP. The editors' expectations are that the text will enable students to better understand the significance of the 1980 census and to appreciate the fact that they are, through their role as enumerators, an important link in the factfinder tradition.

The volume consists of four parts and an appendix. Part I provides the context within which the decennial censuses were and are conducted. The history of census taking in the United States is described (chapter 1), the reader is introduced to the Census Bureau as an organization (chapter 2), and several issues of current and continuing relevance to the planning and administration of the decennial census are examined (chapter 3). Part II focuses on the concepts and principles that are fundamental to the ways that census data are collected and tabulated. An overview of census geography is provided in chapters 4 and 5. The relationship of governmental areas and their boundaries to the census is described first and is followed by a chapter that explores the census geography needs of a changing United States. Beyond knowing the geographic areas for which data are collected and reported, one needs to be aware of the concepts, definitions, and limitations of census data so they are used intelligently (chapter 6). Several of the concepts and principles are explored in a chapter on demography (chapter 7), one of the major professional fields studying populations.

Part III provides an overview of the 1980 census. Chapter 8 begins with a discussion of the planning that began in 1973 for the 1980 census and is followed by a detailed discussion of the Census Bureau's field organization and data collection procedures (chapter 9). Chapter 10 describes statistical products and data user services that will be available to access 1980 decennial census data. Part IV concludes the volume by providing an overview of the uses of census data, primarily using case studies derived from the 1960 and 1970 decennial censuses. These four chapters, contributed by professors of urban and regional planning, business, geography, and demography (chapters 11 through 14), introduce the uses and applications of census data in the research community as well as the public and private sectors.

CENSUS '80 was written during the summer and fall of 1979. Many people contributed to the production of this book, and it is not possible to acknowledge all the assistance we have received. At least one senior author prepared or edited each chapter taking full advantage of Census Bureau employees' experience and the enormous volume of published and unpublished material available within the Bureau. Charles P. Kaplan exercised general supervision for the writing, editing, and publication of the book, wrote chapters 3 (part), 4, 5, 6 (part), 7 (part), and prepared the drafts for chapters 2, 8, 9, and 10. Thomas Van Valey, of Western Michigan University, shared in developing the overall book structure, wrote chapters 1, 2, and 3 (part), and contributed appendices B, C, and D.

The applications chapters in Part IV were written by Joel B. Goldsteen of the University of Texas at Arlington (chapter 11), Joseph Van Matre of the University of Alabama in Birmingham (chapter 12), Borden D. Dent of Georgia State University (chapter 13), and Dudley L. Poston, Jr. of the University of Texas at Austin (chapter 14). Additionally, Van Matre provided substantial advice on the structure of chapter 6 and Poston helped redraft and author chapter 7. Selective editing of these chapters was done in the interests of uniformity of style and treatment.

A number of the Census Bureau staff made substantial contributions to specific chapters and reviewed the text for technical accuracy. Leslie D. Solomon prepared the original thematic outline for the book, created many of the inserts in chapters 8, 9, and 10, and participated in the overall research and editing process. Forrest B. Williams co-authored chapter 6. Lawrence T. Love co-authored the final draft for chapter 9. Michael G. Garland and Deborah D. Barrett gave valuable comments and technical advice on drafts of the entire volume and, in particular, for data products and user services. Paul T. Zeisset contributed technical materials that are incorporated throughout the text. Fred Bohme was particularly helpful in drafting and reviewing the census history portions of Part I. Kimberly Bowers and Cathy Clark handled the liaison for copyright materials and performed a wide variety of tasks including library searches and the checking of facts. Within the Publication Services Division, several individuals made contributions in the areas of publication planning and editorial review. Also, Beulah Land, Donald C. Dahmann, C. A. Willoughby, Mark Mangold, Jennifer Peck, Hallie Bradley, Evelyn Hollabaugh, Dorothy Robinson, Dorothy Whitson, Diane Rouse, Don Levine, Alice Winterfeld, Brendan Linnane, Morris Gorinson, John Dycus, Dave Galdi, and Theodore G. Clemence provided numerous helpful suggestions and directed the authors to appropriate information sources. In acknowledging the assistance that we have received, the senior authors assume responsibility for any errors or other shortcomings of the book.

PART I

CONTINUING THE FACTFINDER TRADITION

INTRODUCTION

We need information to run our democracy. . .information that is both current and accurate. While this idea is widely accepted today, it was also recognized by the Nation's founders when they made the census an integral part of the American Constitution. Moreover, in doing so they made a decision that was unique in history. No other nation, from its very birth, had initiated a mechanism that could provide an accurate basis for the apportionment of political power as well as the collection of information about its people. Today, the factfinder tradition of the Bureau of the Census continues.

The census in America is the story of a job that has steadily grown more complex as the Nation has grown and changed, and as the needs for data have increased. In 1790, the United States was a small, rural, agricultural nation containing fewer than four million people, almost 95 percent of whom lived and worked on farms. There was little commerce and industry as we know it today.

For many of these early Americans, there was little regular opportunity for the exchange of goods or services, either as buyer or seller. Instead, they lived in a largely self-sufficient manner, occasionally purchasing goods from an itinerant peddler, producing the bulk of their own food, shearing the wool that they spun and wove into cloth for their own clothing, cutting the logs and constructing their cabins and sheds, and even fashioning most of their own farm equipment. When specific items could not be produced by a family member and were otherwise unavailable, a quarterly or semiannual trip to the nearest marketplace would often prove to be the only alternative to doing without. By the same token, there was little need for information about the population beyond the simple counts that were useful for political, taxation, and military purposes.

Three quarters of a century later, the Nation had changed considerably. In 1870, the total population numbered almost 40 million people, and fully 25 percent lived in the Nation's 663 towns and cities of 2,500 persons or more. Moreover, the number of people employed in agriculture had declined to less than half of the total labor force. More and more people were living in or near the Nation's cities and were engaged in nonagricultural employment. These significant social and economic changes in structure, composition, and distribution of people were accompanied by an increase in the demand for information. In short, the continued development of the Nation encouraged public acceptance of a census that did provide a more detailed and useful profile of the American people.

Today, it is clear that the American society has undergone a massive transformation. From the 4 million people enumerated in 1790, the Nation has grown to more than 200 million. In contrast to the 24 cities that existed in 1790 (including the Nation's largest cities: New York, 32,305, Philadelphia, 28,552, and Boston, 18,038) there were over 7,000 urban places by 1970. The urban places contained almost 150 million people, which was three-quarters of the total population of the United States. Of special significance though, is the change in the number of people employed in agriculture. In 1970 it amounted to 3.1 percent of the total labor force compared to 95 percent in 1790. From a small, rural, agricultural nation at its beginning, the United States has developed into a large, urban, industrial nation with sophisticated transportation and communication systems supporting its enormous production and distribution capabilities.

These developments have been accompanied by a growing need for specific, accurate information. Commerce, business, and industry depend on the answers to questions such as "who," "when," "where," "how often," and "how many. . . ." Similarly, in the delivery of public services, major decisions affecting people's lives and the operations of all levels of government are increasingly based on information provided by the Census Bureau. Tens of billions of Federal dollars alone are allocated using population data in the allocation formula. Thus, keeping abreast of a constantly changing Nation has required a statistical organization that itself changes to approach new problems with new solutions. What follows is the story of the Census Bureau's decennial (every 10 years) census, how it functions, and what it does to merit the title, "Factfinder for the Nation."

What Is A Census?

Few Americans have had a reason to precisely define what a census is, let alone why it is taken, who does the work, what is done with the data after they are collected, tabulated, and published, and how census information is used.

A common dictionary definition of a census is "an official, usually periodic enumeration of the population."[1] A more technical definition is provided by the United Nations: "A census of population may be defined as the total process of collecting, compiling, and publishing demographic, economic, and social data pertaining, at a specified time or times, to all persons in a country or delimited territory."[2] Both of these definitions refer to a census of population. Yet, as we shall see, a census actually can be a count of any class of identifiable entities—business establishments, housing units, farms, or even governments themselves, as well as people. For this reason, censuses are one of the most important means for a complex society to find out about itself.

Early Censuses

Census taking had its beginning in ancient times in Babylonia, China, Egypt, Palestine, and Rome. Few of the results have survived, however. The word "census" comes from the Latin "censere," meaning "to tax," or "to value." Thus, it is not surprising that early counts of people were typically undertaken for the purpose of taxation, or for conscription either into the labor force or the military. Furthermore, the early counts were usually limited to heads of households, males of military age, taxpayers, or adult citizens; women and children were seldom counted. Quite understandably, census taking has typically been resented by the people.

Ancient censuses are mentioned in the Bible, the first at the time of the Exodus, about 1490 B.C.

> The Lord spoke to Moses. . .in these words: "Number the whole community of Israel by families in the father's line, recording the name of every male person aged twenty years and upward fit for military service." So Moses and Aaron. . .summoned the whole community on the first day of the second month, and they registered their descent.[3]

A second census mentioned was taken about 1000 B.C. at the order of King David.

> [David]. . .instructed Joab and the officers of the army with him to go around all the tribes of Israel, from Dan to Beersheba, and make a record of the people and report the number to him. . .They covered the whole country and arrived back at Jerusalem after nine months and twenty days. Joab reported to the King the total number of people: the number of able-bodied men, capable of bearing arms, was eight hundred thousand in Israel and five hundred thousand in Judiah.[4]

During the Roman Empire, censuses were taken from about 550 B.C. As elsewhere, citizens and their property were inventoried for fiscal and military purposes. At first, these censuses included only the districts in the general vicinity of Rome. However, over time they were expanded, until by 5 B.C. the entire empire was included. One of these Roman censuses is well known:

> In those days a decree was issued by the Emperor Augustus for a registration to be made throughout the Roman world. For this purpose everyone made his way to his own town; and so Joseph went up from Judaea from the town of Nazareth in Galilee, to register at the City of David, called Bethlehem.[5]

After the fall of the Roman Empire, census taking practically ceased in the western world with the exception of the Domesday inquest which was ordered by William the Conqueror of England in 1086 to assess the population and wealth of the newly-conquered realm. Again, this accounting only covered landholders and their holdings. The Middle Ages represented a long interruption in the history of census taking in western civilization.

It is hard to say when the first census of a modern type was carried out. According to the demographer Thomlinson, "the first known counting of every man, woman, and child occurred in central Europe in 1449, when Nuremburg was enumerated because its leaders feared depletion of a limited food supply under a state of siege: as is often the case in such circumstances, results of the research were considered state secrets."[8] Nouvelle France (later Quebec) and Acadie (later Nova Scotia) had 16 enumerations between 1665 and 1754. In Europe, censuses in some of the Italian principalities (e.g. Naples and Sicily) go back into the 17th century. And, in the established Lutheran Church of Sweden, the clergy had been compiling lists of parishioners for some years prior to the time when they were required to take annual (later triennial) inventories. It is generally agreed, however, that the first continuing complete count, taken at regular intervals was instituted in Sweden in 1749. Norway and Denmark followed in 1769, while the census in the United States began in 1790.

In summary, then, the evolution of the modern census was a gradual one. Beginning with the objectives of determining military, tax, and labor obligations, censuses in the 19th century changed their scope to meet other administrative needs as well as the needs of business, labor, education, and academic research. Yet, the taking of household censuses often had to take place over many years before the combination of public trust, administrative experience, and technology combined to produce counts that were complete, accurate, and collected from all areas of the Nation simultaneously.

Dates of First Censuses for Selected Countries

Country	Date	Country	Date
Sweden	1749	Italy	1861
Norway	1760	Canada	1871
USA	1790	India	1881
Spain	1798	Egypt	1897
France	1801	Russia	1897
Great Britain	1801	Mexico	1900
Belgium	1820	Australia	1911
Greece	1836	Brazil	1920
Switzerland	1860	Japan	1948

NOTE: While the U.S. Census was not the first, it was among the earliest of the modern censuses.

Part I, "Continuing the Factfinder Tradition," consists of three chapters each of which addresses a different aspect of the evolution of census taking in the United States. Chapter 1 specifies the decade-by-decade transition of the census process from 1790 to 1980 and provides an overview of census activity in this country. A very important consideration in census taking is the professional capability of the governmental organization that actually plans and administers the population count. Thus, chapter 2 introduces the reader to the people "Behind The Numbers," the employees of the Bureau of the Census and the work that they do. To conclude Part I, chapter 3 examines four topics relevant to the planning and administration of the 1980 Decennial Census of Population and Housing—privacy, accuracy, the use of census data in Federal revenue-sharing formulas, and the cost of the census to the Nation.

References

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3. *The New English Bible* (New York: Oxford University Press, 1971), Numbers 1:1-10.
4. *Ibid.*, Samuel 24:1-9.
5. *Ibid.*, Luke 2:1-5.
6. Thomlinson, Ralph, *Population Dynamics* (New York: Random House, 1965), pp. 63-64.

Chapter 1

TWENTY CENSUSES

Before the American Revolution, there were 38 censuses carried out within the colonies (e.g., Virginia in 1624; New York in 1712; Connecticut in 1756; Massachusetts in 1764; Rhode Island in 1774). Most of these enumerations were performed at the request of the British Board of Trade to aid them in the administration of the colonies. The need for a census of the entire United States arose as soon as the colonies broke their ties with Great Britain. The war costs had been high and the new nation had to find ways to pay the debt. Under the Articles of Confederation, each State was to contribute to the common defense and general welfare in proportion to the value of its land. But the new Constitution, adopted in 1787, provided for apportionment of both the contributions and the representation in Congress on the basis of population. Cleverly, delegates believed that an accurate count would occur because of conflicting desires—the desire for the least taxes (i.e., a low number of people) being counterbalanced by a wish for the greatest number of congressmen (i.e., a large number of people). The delegates made the decision not to include Indians who lived in the hinterlands, for they were not a source of revenue and were only under nominal government control. As for slaves, the "New Jersey Compromise" between the more populous free states and the slaveholding states resulted in every five slaves being counted as three persons for purposes of apportionment. Thus, Article I, section 2, of the Constitution reads:

> Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union, according to their respective Numbers, which shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, three-fifths of all other Persons. The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct. The Number of Representatives shall not exceed one for every thirty thousand, but each State shall have at least one Representative. . ."[1]

In response to this event, the French statistician, Moreau de Jonnes, declared that the United States presents a phenomenon that is without parallel in history— "that of a people who instituted the statistics of their country on the very day when they founded their government, and who regulated by the same instrument the census of inhabitants, their civil and political rights, and the destinies of the nation."[2]

THE FIRST ENUMERATION—1790

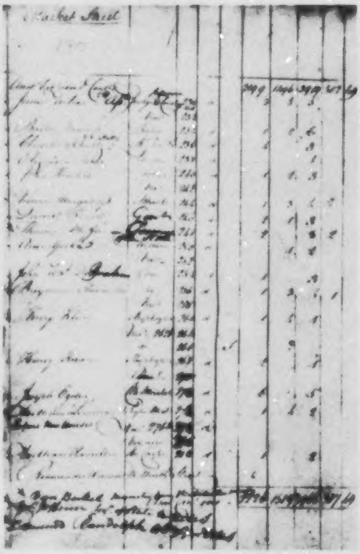
The information needs of the new society began to change after the Revolution. Although the needs for reapportionment and taxation required only a single head count of free persons and slaves, some members of the first Congress—notably James Madison—urged the collection of additional information about the people as a guide to future legislation.

> . . .if this bill was extended so as to enhance some other objects besides the bare enumeration of the inhabitants, it would enable [Congress]. . .to adapt the public measures to the particular circumstances of the community. . . to know the various interests of the United States, it is necessary that the description of the several classes into which the community is divided should be accurately known.[3]

Madison therefore proposed that white persons be classified by sex, white males by age, and that a count be made of people employed in each occupation.

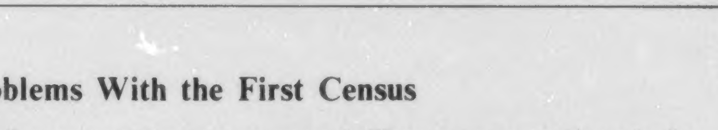
This view did not prevail in its entirety, however. Like many people in history before them, some representatives objected to answering questions they considered violations of individual privacy, while others objected to the extra cost that would be imposed by such census reporting. Consequently, the first Census Act of 1790 called for the name of the head of the family and the number of persons in each household of the following description: free white males 16 years old and upward; free white males under 16 years; free white females; all other free persons; and slaves. Madison's suggestion relating to occupational information was deleted and did not appear again until 1820.

Secretary of State Thomas Jefferson is generally credited with directing the Nation's first census. The job of enumerating the people, though, was given to the 16 Federal marshals, one for each of the existing States (Connecticut, Delaware, Georgia, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, and Virginia), along with the territories of Kentucky, Maine, Vermont and the governor of the Southwest Territory. These people, in turn, hired assistants called "enumerators" to actually do the work. The first enumeration was ordered to begin on Monday, August 2, 1790, less than a year after the inauguration of President Washington and the assembling of the first Congress of the United States. It was scheduled to be completed within 9 calendar months.



The attached picture is a photograph of a page from the Philadelphia census records for 1790 -- the first year in which a Federal census was taken. The last three names on the page are those of Van Berkel, "Minister from the Netherlands;" Tho. Jefferson, "Sect. of State to the U.S.," and Edmund Randolph, "Atty. Genl. to U.S." About half-way down the page may be seen the name of Thomas Mifflin, "Governor of the state."

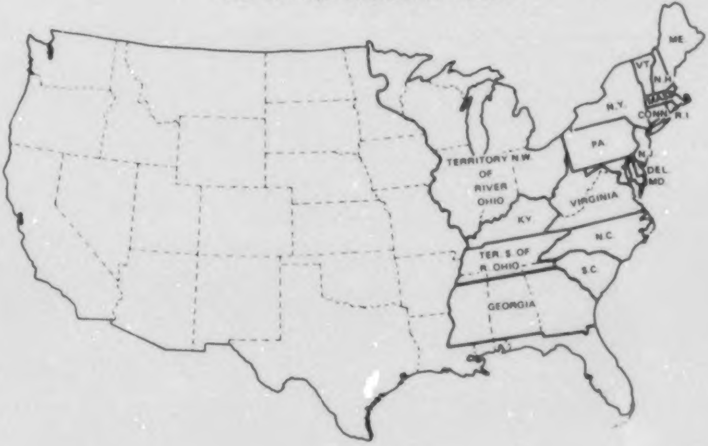
The law providing for the first census required that after the census had been taken, the schedules should be left open in a public inn or tavern so everybody could examine the books to see if he had been enumerated. In 1790, Jefferson and Randolph were members of President Washington's cabinet, and were therefore living at the national capital, Philadelphia. Realizing that they were not enumerated at their plantations in Virginia, these men went to the tavern and signed their own names on the Philadelphia schedules.



Problems With the First Census

This first enumeration was no easy task. There were no questionnaire forms, so enumerators in all States and territories (with the exception of Massachusetts) had to supply their own, and paper was a substantial expense in those days. The enumerators encountered many other obstacles as well. The people of the fledgling Nation were scattered from Maine to Georgia and westward towards the Mississippi River. Much of this territory

The United States in 1790



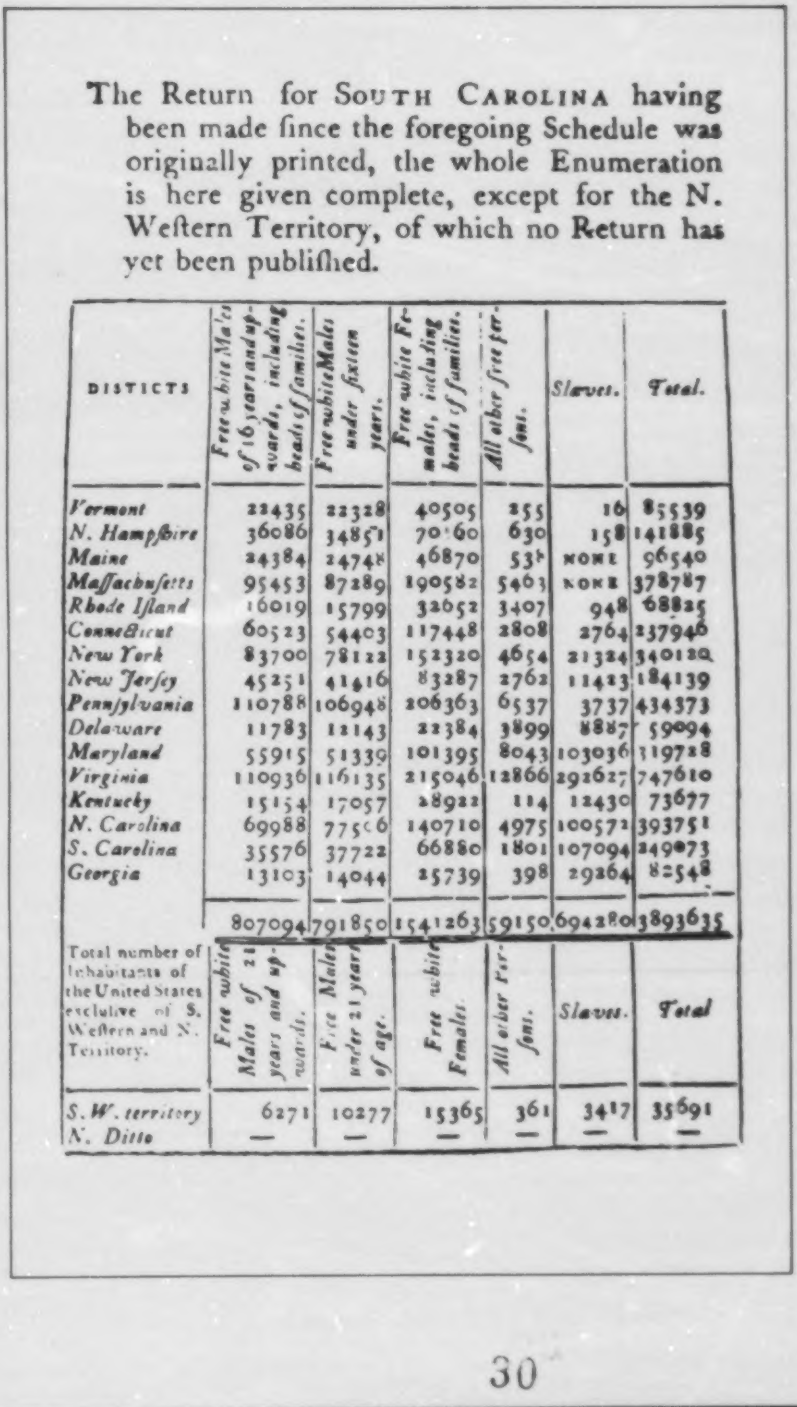
Source: Bureau of the Census

had to be covered on horseback or on foot, but, in thinly settled areas, roads were few and bridges were all but unknown. The boundaries of towns, some counties, and other civil divisions were poorly defined. Furthermore, many people did not know why the enumerator was taking the census and thus were suspicious, uncooperative, and sometimes openly hostile. Often an enumerator could not safely enter a specific area. A few people refused to respond to the census takers, although the law provided that anyone refusing would "forfeit twenty dollars." Some of these people were prosecuted, but history does not record whether any of them actually paid the fine.

In October of 1791, all of the census reports had been turned in except the one from South Carolina. This was not received until March 3, 1792. Thus, the first census of the United States, which had been scheduled for 9 months, took 18 months to complete. It revealed a population of 3,929,326.

The total population count reported by the first census caused considerable disappointment. Thomas Jefferson clearly expected it to be larger, as indicated in the following excerpt from a letter written on August 29, 1791.

> I enclose you also a copy of our census, written in black ink so far as we have actual returns, and supplied by conjecture in red ink, where we have no returns; but the conjectures are known to be very near the truth. Making very small allowance for omissions (which we know to have been very great), we are certainly above four millions. . .[Emphasis added].[4]



The Return for SOUTH CAROLINA having been made ſince the foregoing Schedule was originally printed, the whole Enumeration is here given complete, except for the N. Weſtern Territory, of which no Return has yet been publiſhed.

DISTICTS	Free white Males of 16 years and upwards, including heads of families.	Free white Males under ſixteen years.	Free white Females, including heads of families.	All other free perſons.	Slaves.	Total.
Vermont	22435	22328	40505	255	16	85539
N. Hampſhire	36086	34851	70160	630	158	141885
Maine	24384	24748	46870	538	NONE	96540
Maſſachuſetts	95453	87289	190582	5463	NONE	378787
Rhode Iſland	16019	15799	32652	3407	948	68825
Connecticut	60523	54403	117448	2808	2764	237946
New York	83700	78122	152320	4654	21324	340120
New Jerſey	45251	41416	83287	2762	11423	184139
Pennſylvania	110788	106948	206363	6537	3737	434373
Delaware	11783	12143	22384	3899	8887	59094
Maryland	55915	51339	101395	8043	103036	319728
Virginia	110936	116135	215046	12866	292627	747610
Kentucky	15154	17057	28922	114	12430	73677
N. Carolina	69988	77506	140710	4975	100572	393751
S. Carolina	35576	37722	66880	1801	107094	249073
Georgia	13103	14044	25739	398	29264	82548
	807094	791850	1541263	59150	694280	3893635
Total number of Inhabitants of the United States excluſive of S. Weſtern and N. Territory.	*Free white Males of 21 years and upwards.*	*Free Males under 21 years of age.*	*Free white Females.*	*All other Perſons.*	*Slaves.*	*Total*
S. W. territory	6271	10277	15365	361	3417	35691
N. Ditto	—	—	—	—	—	—

FORMATIVE STAGES: 1800 TO 1870

The 1800 and 1810 population censuses were similar in scope and method to the first census. Members of Congress, as well as statisticians and other scholars, both within and outside the Federal Government, followed Madison's early lead and urged that other information needed by the new government should be collected while the population was being canvassed. Moreover, the Nation grew mightily during this period in all respects—territory, population, and economic vigor. However, the census requirements grew only slightly. Questions were added relating to physical disabilities and to persons of foreign birth who had not been naturalized, but the total amount of data collected still remained at a bare minimum.

Spurred by the international situation that led to the War of 1812, the Congress required the marshals for the 1810 census to count "the several manufacturing establishments and manufactures within their several districts, territories and divisions."[5] Unfortunately, though, this first attempt at an industrial census met with little success. Businesses were not yet major users of census data and were reluctant to report facts that might be of interest to their competitors.

The census of 1820 covered the subjects of population and manufacturing in somewhat greater detail than preceding ones. This census is notable for having obtained for the first time the numbers of the population engaged in agriculture, commerce, and manufacturing (questions initially suggested by James Madison for the first census). As a result of the numerous problems that made the data virtually worthless, the census of manufactures was dropped again in 1830, and the census retreated essentially to the same population questions that were used from the beginning, although its scope was substantially extended. The use of uniform printed schedules also began with the census of 1830. In previous censuses, the marshals or their assistants simply used whatever paper was available, ruled it, wrote in the headings, and bound the sheets together.

1790 Census Forms

The paper for the schedules was furnished by the enumerators themselves, and is of many different kinds. It varies from 4 to 36 inches in length, the longer sheets requiring several folds. Many enumerators used merchants' account books, journals, or ledgers; others used large sheets of paper, neatly ruled and folded. The headings were generally written in by hand, but printed headings were used on the schedules for Massachusetts and for one district in New York. All of the schedules for Massachusetts were on printed blanks of uniform size, a fact which suggests that the blanks were furnished or sold to the enumerators by the marshal... For a binding sometimes any old newspaper, heavy wrapping paper, or a piece of wall paper was used.[6]

Given that the total population was expected to be more than four times that of the first census, the Census Act for 1840 authorized the establishment of a centralized office that would operate during each enumeration and then be disbanded once the reports were issued. It also provided for the collection of "...all such information in relation to mines, agriculture, commerce, manufactures, and schools, as will exhibit a full view of the pursuits, industry, education, and resources of the country."[7] This extensive program of data collection demonstrates how far the census had moved from the idea of a mere count of free persons and slaves. From the beginning, the narrow view that the census should be limited to what the Constitution explicitly requires has never been applied to any of the Nation's enumerations.

From the first census of 1790 through the sixth census of 1840, the household, rather than the individual, was the unit of enumeration in the population census; only the names of household heads appeared on the schedule. There were also no tabulations beyond the simple addition of the entries submitted by the marshals, and no attempt was made to publish the details uniformly by cities and towns, or to summarize the returns for each State by county—unless the marshals themselves had done so. The legislation that governed the taking of the seventh, eighth, and ninth decennial censuses (1850, 1860, and 1870) provided for several changes in census procedures. For reporting purposes, each marshal was responsible for subdividing his district into known civil divisions such as counties, townships, or wards. He was also made responsible for checking to ensure that the returns of his assistants were properly completed. Furthermore, the number of population inquiries was expanded; every person's name was to be listed, and the items related to each individual were to be enumerated. A variety of "social statistics" (e.g., information relating to taxes, schools, crime, wages, value of estate) and statistics on mortality were also collected for the first time in 1850.

By 1860, there were six separate questionnaires carrying a total of 142 items. They covered the following areas: Population, health, mortality, literacy, pauperism, occupation, income, wealth, agriculture, manufactures, mining, fisheries, commerce, banking, insurance, transportation, schools, libraries, newspapers, crime, taxes, and religious bodies. In effect, this was a relatively complete inventory of national activity. As Madison had predicted, Congress found it impossible to legislate without facts. New and old States alike needed data on which to base their legislative and tax structures. In addition, the expanding economy and developing social sciences created ever growing demands for data.

A noteworthy feature of the 1870 census was the introduction of a rudimentary tabulating machine for use in data processing. Another innovation was the employment of maps, charts, and diagrams to graphically present the most significant facts of the enumeration. But so much information was collected that some of it could not be published before the next census was due. In addition, hand tallying and the lack of any procedures for verification led to many errors. Census officials themselves testified to numerous weaknesses in census operations. One critic of 1870 was quite explicit:

> In the majority of cases the enumerators made no pretence of carrying on a house-to-house canvass, but attended court sessions, musters, public meetings, etc., wherever a body of men was gathered, and there got such names and other information as they could. That this was the method employed in the majority of counties of the South the Census office has abundant proof...[8]

TRANSFORMATIONS: 1880 TO 1900

Although attempts to initiate a centennial census in 1875 failed, the census of 1880 was on a scale befitting a centennial. The number of items of information collected reached the almost unbelievable total of 13,010. This expansion, of course, focused even more attention on the weaknesses of previous censuses that had already been identified: (1) there was no continuing census organization to provide for advance planning; (2) the volume of data to be collected swamped the marshals, who had responsibilities other than the taking of the census; (3) there still was no check of the data for accuracy; and (4) slow processing and tabulation procedures made some figures obsolete before they could even be published.

In response to these continued pressures, the Congress ordered a committee headed by Gen. James A. Garfield to make an exhaustive study of census

Francis A. Walker

Superintendent, Census of 1870
Superintendent, Census of 1880 (1879-1881)

". . . The labor of organizing and energizing a census is such that no man can conceive who has not himself undertaken it, or, at least stood close by and watched the machine in full operation."

"What the country wants is more information, not less."

operations. The resulting legislation first affected the census of 1880 and constitutes one of the major landmarks in census history.

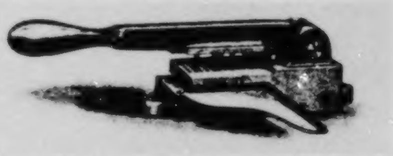
The Census Act for 1880 provided for the establishment of a census office to be located in the Department of Interior, and the appointment, by the President, of a Superintendent of the Census for the duration of the census process. Another important change for the 1880 census was for specially appointed enumerators and supervisors to be used in place of marshals and their assistants. Staffing and pay were liberalized, and checks on the quality of work were installed. In addition, each supervisor was required to propose appropriate subdivisions of his district and recommended suitable persons to work as census takers. "Special Agents" — professionally qualified people—were hired to collect and tabulate economic and social statistics. As a result of these changes, the census was substantially upgraded, with the consequence that the coverage and accuracy of the enumeration were sharply improved. Nevertheless, two major problems remained unsolved. Because Congress was unwilling to provide the necessary funds, the lack of a permanent census organization still handicapped planning, and some reports of the census of 1880 could not be prepared for the public until as late as 1887.[9]

One of the most important provisions of the 1880 Census Act, though, was the fact that for the first time it prohibited enumerators from disclosing any information collected in the census. From the time of the first census in 1790, some people had resisted the census as an invasion of their privacy. This was further aggravated by the fact that there had been no law limiting the extent to which information on any questionnaire could be seen by the public or put to use by the enumerator, marshal, or others. Although the marshals and their assistants had been instructed as early as 1840 that the information was to be kept confidential, there was no legal restraint imposed.

In 1890 the scope of the decennial census was again expanded. Some subjects were covered in even greater detail than before. Data were collected in supplemental surveys on farm and home mortgages, and on the indebtedness of private corporations and individuals. The census of 1890 also provided, for the first time, a separate questionnaire for each family. In previous censuses, data for several families had been recorded on a single questionnaire.

It is the solution to the problems of staff continuity and prompt reporting of results that gave the censuses of 1890 and 1900 a place of special importance in the history of census taking in the United States. With the development of the basis for a high-speed data processing system and the establishment of a permanent organization, for the first time in its history the Nation had an organization and facilities capable of planning and executing the large-scale statistical operation required by the national interest. Hence, the results could be reported to the public with reasonable speed.

Punchcard and electric tabulating equipment developed by a former Bureau employee, R. Herman Hollerith, were first used in the census of 1890. These devices made it possible to process, tabulate, and publish the results of the census faster then ever before. Moreover, they paved the way for even greater technological developments to come.



THE HOLLERITH ELECTRIC TABULATING SYSTEM

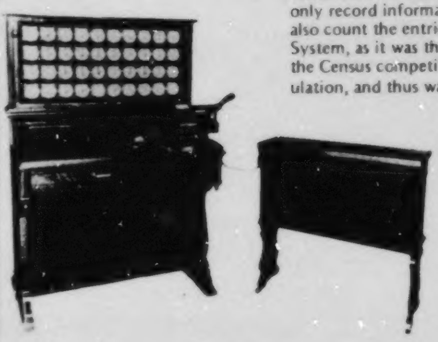
GANG PUNCH

HERMAN HOLLERITH, WASHINGTON, D. C.

Herman Hollerith (1860-1929), was born in Buffalo, New York to George and Franciska Hollerith. He graduated from the School of Mines at Columbia University in 1879, and immediately went to work in the Census of 1880. While there, he met Dr. J.S. Billings, who, it is generally agreed, suggested the idea of a machine to carry out the mechanical task of tabulating information that until then had to be done by hand. Hollerith decided the idea was practical, and went to work on it.

In January of 1889, Hollerith was issued three patents. These were for a set of tabulating machines that would not only record information using holes punched in cards, but also count the entries. The Hollerith Electric Tabulating System, as it was then called, subsequently won a Bureau of the Census competition against two other methods of tabulation, and thus was selected for use in the census of 1890.

In 1896, Hollerith organized the Tabulating Machine Company, Incorporated, to manufacture the machines and the cards that the system employed. In 1911, this company was consolidated with two other firms to become the Computing - Tabulating - Recording Company, later reorganized and renamed as the International Business Machines Corporation (IBM).[10]



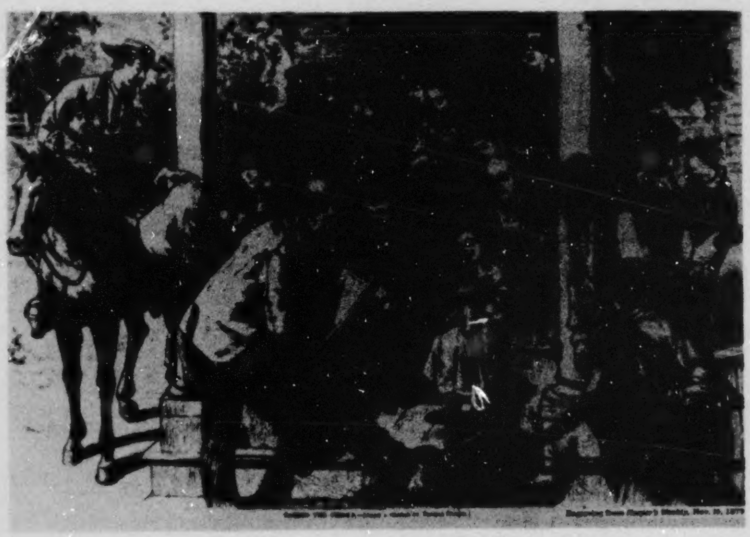
On March 6, 1902, Congress designated the temporary organization that had been established for the census of 1900 as a permanent Bureau within the Department of Interior. Three years later the Bureau was moved to the Department of Commerce and Labor. Now, for the first time, there was a continuing organization. Professional staff members, corresponding to the earlier "Special agents," took charge of the special programs. Furthermore, a census geographer was appointed to tackle the long-standing problem of indefinite jurisdictions, and a small research staff began collecting information on census methods all over the world. Much study was devoted to reducing the burdens of data collection and processing. As a result, a decision was made to remove specialized censuses, such as manufactures and governments, from the population census and to take them in different years.

THE TWENTIETH CENTURY

The census of 1910 was the first to be taken by this new organization. One important step in the professionalization of the Census Bureau was the method used for selecting temporary employees. Since 1880 both supervisors and enumerators had been appointed by Congress, after being given noncompetitive examinations to determine whether or not they had the basic ability to fulfill their duties. In 1910, though, all prospective census employees were given open, competitive examinations, which were administered throughout the country. This increased the level of skills among those hired and, in turn, the quality of the data that resulted.

Another notable feature of the 1910 census was the method used in presenting the results. The first statistics that were ready (especially those in the greatest demand, such as the total population of individual cities and States, and of the United States as a whole) were given out in the form of press releases. They were then presented in greater detail in the form of official bulletins, and again in an abstract with the individual State supplements. They appeared in this form 6 months to a year before the final reports were issued.

Significant improvements were also made in data processing, many of them developed in the Bureau's own Engineering Laboratory. The tedious process of punching data cards was speeded up by devices that were able to punch an entire series of recurring items into whole stacks of cards. In addition, mechanized punches replaced the previous hand-operated models. Thus, tabulating was much faster, and by the time of the 1920 census, machines could handle five times as many cards as those of 1900. Finally, a start was made toward mechanized quality control, as more sophisticated equipment was designed to reject certain enumeration and punching errors.



THE CENSUS REPORTING BURDEN HAS STEADILY DECLINED

Between 1850 and 1890, the census reporting burden became the heaviest ever borne by the American public. In 1890 there were 233 separate schedules covering 22 subjects, with a potential of 13,161 questions. Since then the reporting burden has declined steadily and substantially.

- entire categories of questions were dropped as the information became available from other sources.
- other categories were dropped by the Congress as objectionable.
- sampling procedures relieved 80 percent of the households from answering more than the six basic population questions, plus certain standard questions concerning housing.
- as industries such as insurance and public utilities became regulated they were removed from the census.
- small businesses and farms were eliminated when essential information became available from Internal Revenue or Social Security reports.
- many concerns could report simply by supplying copies of routine business forms or computer tapes.
- sampling procedures made it possible to collect many types of information from samples as low as 5 percent of the total establishments.

The census of 1910 also included one of the Bureau's earliest research projects—an experimental in-the-mail census with the questionnaires left at households by the mail carriers. Although it was abandoned as unworkable

By the President of the United States of America:
A Proclamation (1910)

I, WILLIAM HOWARD TAFT, President of the United States of America, do hereby declare and make known that, under the Act aforesaid, it is the duty of every person to answer all questions on the census schedules applying to him and the family to which he belongs, and to the farm occupied by him or his family, and that any adult refusing to do so is subject to penalty.

The sole purpose of the census is to secure general statistical information regarding the population and resources of the country, and replies are required from individuals only in order to permit the compilation of such general statistics. The census has nothing to do with taxation, with army or jury service, with the compulsion of school attendance, with the regulation of immigration, or with the enforcement of any national, State, or local law or ordinance, nor can any person be harmed in any way by furnishing the information required. There need be no fear that any disclosure will be made regarding any individual person or his affairs. For the due protection of the rights and interests of the persons furnishing information, every employee of the Census Bureau is prohibited, under heavy penalty, from disclosing any information which may thus come to his knowledge.

I therefore earnestly urge upon all persons to answer promptly, completely, and accurately all inquiries addressed to them by the enumerators or other employees of the Census Bureau, and thereby to contribute their share toward making this great and necessary public undertaking a success.[11]

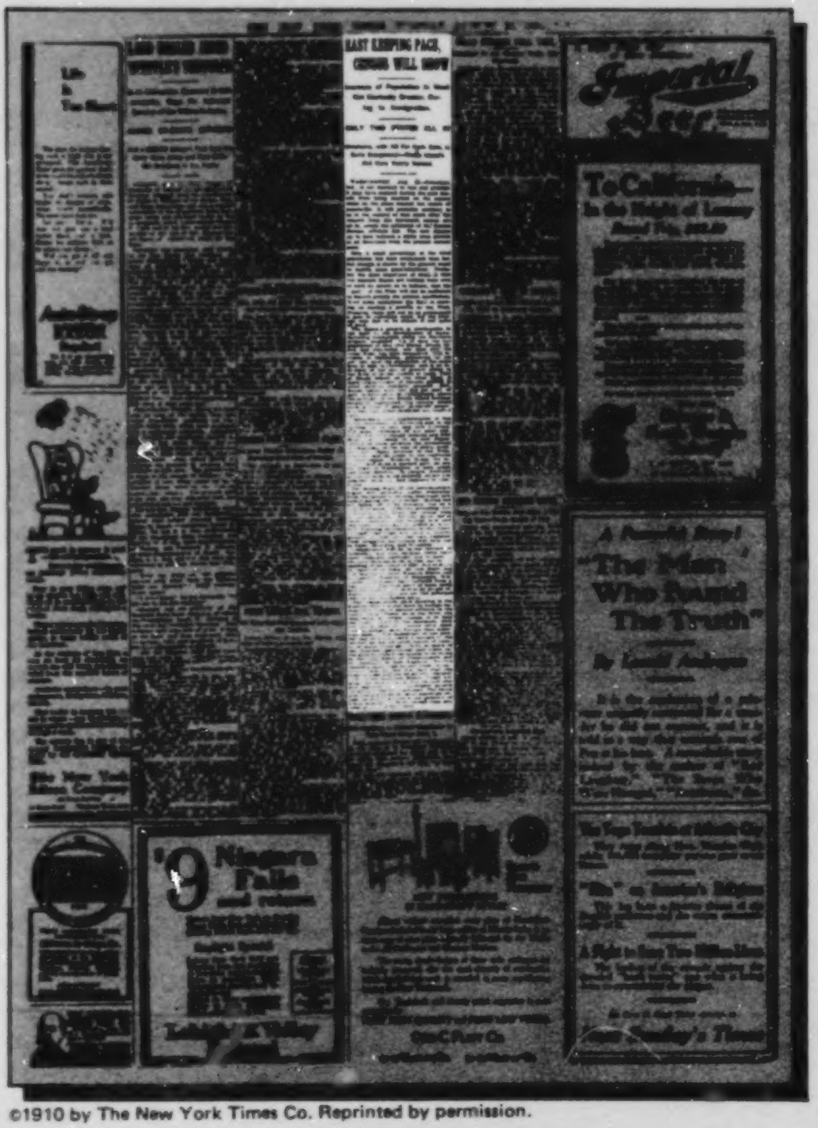
at the time, it sparked a series of studies which later led to the decision to use postal assistance in census taking.

In 1920 and also in 1930 there were continued improvements in collection methods, and minor changes were made in the scope of the census.

However, the 1940 census provided, in many ways, the prototype of today's census, for with it came the development and application of scientific sampling techniques. Previously, such techniques had been tried only experimentally. Based on the principle that an accurate picture of a whole group of similar items can be obtained by examining only a representative sample of them (provided one knows how to select the sample), these methods resulted in much more information at greatly reduced costs, and with much less burden on the reporting public. The same techniques led to the development of "current surveys," which allow the periodic updating of the information published in national censuses.

World War II brought another significant change in program structure. Drawing upon its expertise with sampling procedures, Census Bureau facilities were used for literally hundreds of special surveys of wartime manpower and industrial resources. These were so successful and in such demand that after the war this service was extended on an actual-cost fee basis to other Federal agencies, State and local governments, universities, research institutions, and other organizations.

AUGUST 23, 1910



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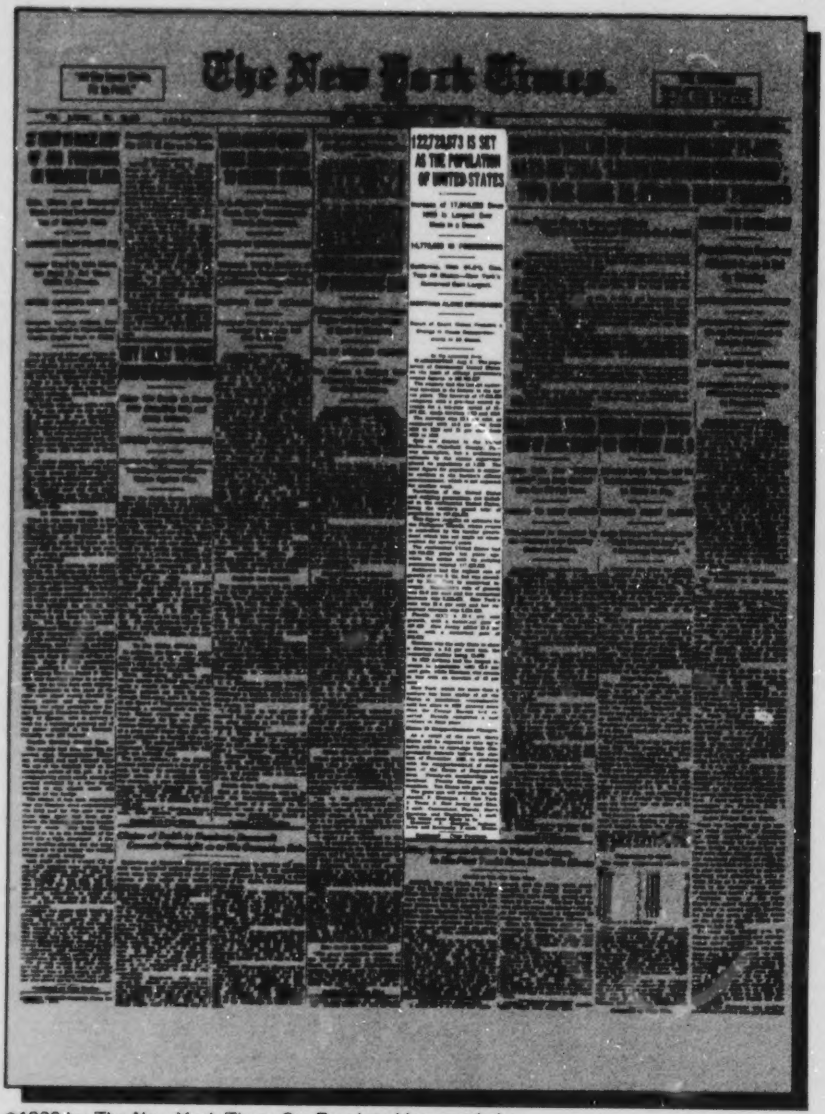
AUGUST 6, 1930



The New York Times.

122,728,873 IS SET AS THE POPULATION OF UNITED STATES

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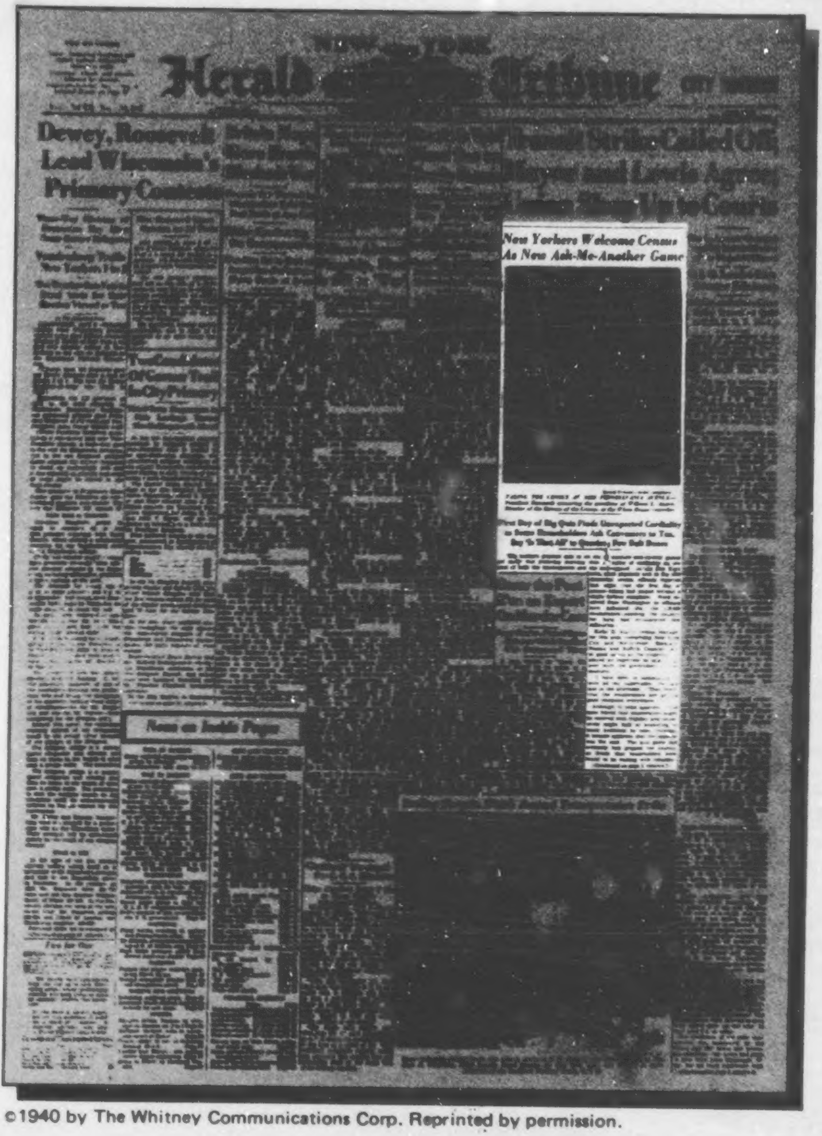
APRIL 3, 1940



NEW YORK Herald Tribune

Dewey, Roosevelt Lead Wisconsin's Primary Contests

Transit Strike Called Off; Mayor and Lewis Agree ... Up to Courts

New Yorkers Welcome Census As New Ask-Me-Another Game

First Day of Big Quiz Finds Unexpected Cordiality

News on Inside Pages

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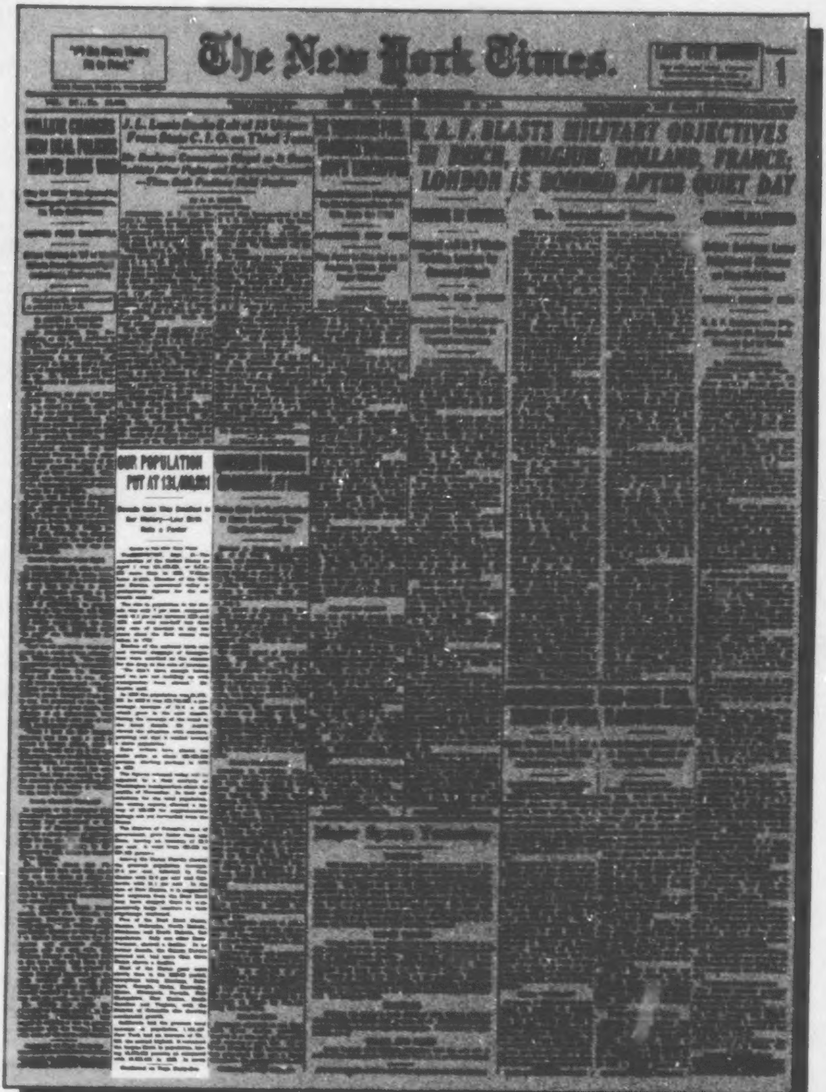
SEPTEMBER 22, 1940



The New York Times.

R. A. F. BLASTS MILITARY OBJECTIVES IN REICH, BELGIUM, HOLLAND, FRANCE; LONDON IS BOMBED AFTER QUIET DAY

OUR POPULATION PUT AT 131,[illegible]

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JULY 23, 1950

The New York Times.

U. S. LINE NEAR TAEJON BOLSTERED AS FOE FORMS FOR NEW ATTACKS; ISLES GUARDING FORMOSA SHELLED

POPULATION OF U. S. SET AT 150,520,198, A RISE OF 19,000,000

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Sampling

The devastating effect of biased sampling is illustrated by an incident which attracted national attention a third of a century ago. The summer before the 1936 Presidential election, the *Literary Digest* undertook an extensive poll of the U.S. population to determine who the next President would be. The *Digest* did things in a big way. More than 10 million double postcards were mailed to persons living in every county in the United States. The list was made up of names taken from every telephone book in the United States, from the rosters of clubs and associations, from state directories, lists of registered voters, mail order lists, etc. The recipients were asked to indicate whether they intended to vote for Franklin D. Roosevelt or Alfred M. Landon for President. A sampling of 10 million people established an all-time record. The response was disappointing: Only 2 million cards were returned. Tabulating the returned cards, the *Digest* predicted the election of Landon by a substantial majority. When the votes were counted, Governor Landon carried only two states. The debacle was fatal to the *Digest*. It went out of business shortly thereafter.

This gargantuan poll suffered from two fatal deficiencies. In the first place, the list was made up predominantly of persons who had telephones or who belonged to clubs and associations. Millions of other citizens who did not enjoy the blessings of either a telephone or a membership were underrepresented in the sample. Those who did not get cards comprised a very different "statistical universe" from those who did. In the second place, the one-fifth of those polled who did respond doubtless also represented a different "universe" from the four-fifths who did not bother to answer, thus contributing a further—and unmeasurable—source of error.

The *Digest* discovered the hard way that mere size of a sample carries no guarantee of producing a representative response. Only if care is taken to assure that the sample drawn constitutes a true cross section of the entire population can it be relied on to produce usefully accurate information.[12]

Reflecting the concerns of the Depression years, the Bureau asked several questions in 1940 that were designed to measure employment and unemployment, internal migration, and income. In addition, the 1940 census was the first to include a census of housing. In prior years, the housing data collected as part of the population censuses were generally limited to one or two items. The first census of housing obtained a variety of facts on the general condition of the Nation's housing stock and on the need for public housing programs.

In 1940 and again in 1950 the sample population questions were asked only for those persons whose names were designated on the sample questionnaire. Thus, some individuals within a household might be included in the sample questionnaire while others might not. In the 1960 census, the sampling pattern was changed in two ways for the population questions. First, if a housing unit was included in the sample, then all of the household members were included in the sample; and second, only a few of the population items were asked of everyone.

Horace J. Voorhis (Dem) from California (1939)

...we can take steps so that we can have information on one of the most important problems that there is in this Nation, the problem of millions of our people living under conditions where the rearing of children in decency and in health is tremendously difficult, to say the very least.[13]

William R. Poage (Dem) from Texas (1939)

We do not know what the housing situation is in the United States. We do not know whether we are embarking on a sound program or not. We are spending the Government's money in total blindness. We do not know in which direction we are going, and it seems to me we would do well to at least get accurate facts and figures. . . but these returns cannot be used, as someone has suggested, as a sucker list whereby any individual can find out whether John Jones has three rooms and Henry Smith has five. There will be no separate information coming from this census that can be used against any single individual. It will be the composite sum of all the information, just as all the rest of the Census Bureau figures are and always have been.[14]

In the late 1940's the Bureau sponsored what was to become one of the major technological innovations in the history of census taking, the development of UNIVAC-I—the first computer designed for mass data processing. It was first used in census processing in the early 1950's, but its application to major census projects was handicapped. Even with sophisticated equipment and highly trained key punch operators, the punch card input system was too slow and too expensive for large-scale data processing. Finally, in the late 1950's, the Census Bureau and the National Bureau of Standards jointly developed an electronic device for "reading" the questionnaires known as FOSDIC (Film Optical Sensing Device for Input to Computers). Special questionnaires were designed on which the answers could be indicated by filling in small circles. The information recorded in this manner could then be read directly by FOSDIC rather than by a clerk (or a small army of clerks) preparing punchcards. In actual practice, the questionnaires were first microfilmed, and then FOSDIC scanned the microfilm copy, converting the filled-in circles directly to computer tape for processing.

The computer also offered new capabilities in the area of quality control. While mechanical tabulators had previously been designed so they would reject impossible answers to the items (e.g., an answer of "3" for sex, when male is "1" and female is "2"), computers can be programed to make comparisons among the many items of information that are stored. Thus, computers were not only able to detect impossible answers, they were able to recognize logically improbable answers to certain items (e.g., a person

HOUSING

Censuses, 1940-Present...

The number of slave houses was asked in the U.S. Decennial Census of 1860, and enumerators inquired about housing on Indian reservations in 1880. There were no general questions on housing in the censuses until 1890. From 1890 to 1920, interest in housing data was concentrated principally on whether or not residences were on farms, whether they were occupied or vacant, and, if owned, whether they were mortgaged. From 1940, detailed decennial censuses of housing have been conducted. In 1950, a number of housing inquiries were asked on a sample basis in order to reduce the response burden, and this practice has continued in subsequent censuses.

The housing censuses are taken in conjunction with, and in the same manner as, the population censuses. The housing censuses cover only those residences which meet the definition of a "housing unit." In general, a housing unit is a group of rooms or a single room occupied or intended for occupancy as separate living quarters; that is, the occupants do not live and eat with any other persons in the building, and there is either direct access from the outside or through a common hall. Transient accommodations, barracks for workers or members of the Armed Forces, and institutional-type quarters (dormitories, wards, large rooming houses, etc.) have not been counted as housing units.

...and Surveys, 1956-Present

As World War II drew to a close in 1945, the Bureau began conducting a number of intercensal surveys of the Nation's housing, most of them concentrating on physical characteristics in selected local areas. A national housing survey, taken in 1956, was the first of its kind to deal with components of change in the inventory and to provide intercensal data on the financing of residential properties.

Annual Housing Survey—In 1973, the Census Bureau began collecting data for the first Annual Housing Survey, and the initial reports in this new series appeared in 1975. These reports cover a number of population and housing characteristics, including some data on the condition of the units and of the neighborhoods in which they are located.

whose age is recorded as 6 years, but who has an occupation recorded as "school teacher"), and in some cases, correct or neutralize them without human intervention. This, of course, tremendously increased the speed and accuracy of data processing and tabulation. As a result of these improvements, nearly all of the data processing involved in the 1960 census was done by computer.

The 1960 census was also the first in which the mail system was used extensively to collect population and housing data. Before the enumerators actually went into the field, mail carriers delivered questionnaires that contained the 100-percent questions (those asked for all persons and housing units) to every occupied housing unit. Householders were asked to complete the questionnaire and hold it until an enumerator called. In the Nation's major urban areas, comprising about 80 percent of the total population, the enumerator left a questionnaire containing the sample questions at every fourth household, and requested the respondent to fill it out and mail it to the census district office. (Self-enumeration had been used on a very limited scale previously but this was the first time it was made a major part of the decennial procedure.) When the sample questionnaires were received in the district offices, the responses were then transcribed to the special FOSDIC forms. In rural areas, the sample information was obtained from every fourth household at the time of the enumerator's visit and recorded directly on the FOSDIC forms.

THE CENSUS TODAY

The 1970 census marked the use in both rural and urban areas of separate, FOSDIC-readable household questionnaires—some 70 million of them. Thus, respondents could mark the appropriate answer circles on their questionnaires, which could then be processed directly without transcription.

The mail system was used even more extensively in the 1970 census than in 1960. Approximately 60 percent of the population in 1970 (essentially that in large metropolitan areas) received questionnaires by mail and were asked to complete them and mail them back to the census district office. These questionnaires contained the 100-percent and, where appropriate, the sample questions. In the areas where this procedure was used, enumerators contacted only the households that had not returned questionnaires or that had given incomplete or inconsistent answers. For the remainder of the population, letter carriers left a census form containing the 100-percent questions at each residential housing unit on their routes. An enumerator

Women in the Labor Force

In 1870, out of a total of 12,505,923 workers, 1,836,288, or 14.7 percent were women. (The 1870 census was the first to include women in the labor-force count.) What did these women do? Over a million were either domestic servants (867,354) or agricultural laborers (373,332). As to the remainder, the following ten occupations supplied work to some of them:

OCCUPATION	NUMBER EMPLOYED
Tailors and seamstresses	97,207
Milliners, dress and mantua makers	90,480
Teachers	84,047
Cotton mill operatives	64,398
Laundresses	55,609
Woolen mill operatives	22,776
Farmers and planters	22,681
Nurses	10,170
Boot and shoe makers	9,642
Carpet makers	5,377

One hundred years later, in 1970, some 30.5 million women were working as paid employees. This figure accounted for 37 percent of the total labor force and represented 40 percent of the total female population of the country over 14 years of age.

then visited each of these households to collect the completed questionnaires and to ask the additional questions for any households in the sample.

Advantages of the mail procedure are easy to understand. Of greatest importance is the fact that reports are likely to be more accurate, since the household has time to think over the questions as well as to consult household records. Also, costs are reduced because of the need for fewer enumerators. Finally, the procedure offers greater privacy to the respondent. These advantages were substantially realized in the 1970 census. In the 1980 census, they are likely to be even more pervasive. Improved computerized methods of compiling address files as well as improved and simplified design of the questionnaire itself permit extension of mail procedures to more than 90 percent of the Nation's population for the 1980 census, and thus improve the accuracy and usefulness of the data collected. Fully developed, the use of the mails will be one of the most significant changes that have occurred over the years since the first census.

The 1970 census was similar to the 1960 census in terms of population items collected on a 100-percent basis (sex, race, age, marital status, and relationship to the head of the household). Most sample questions were asked at either a 15-percent or a 5-percent sample of households, but some were asked for both, thus constituting a 20-percent sample. Only 15 of the housing items were asked on a 100-percent basis; the remaining items were asked on the sample questionnaire. Changes in content over 1960 were relatively minor.

For 1970, extensive discussions with census data users led to a major increase in the number of statistics to be tabulated, especially for blacks and Spanish heritage groups and for small geographic areas. As part of the 1970 census publication program, the Census Bureau released data for each of the 1.7 million city blocks (including all blocks in all urbanized areas) and 35,000 census tracts (a census statistical unit), more than doubling the data released for 1960.

The 1970 population and housing census data were published in a series of reports (discussed in part III). In addition, computer summary tapes containing much more detail than the printed reports remain available for sale to the many users with access to electronic data-processing equipment. Similar data products will be released in computerized form from the 1980 census.

The 1980 census is similar to the censuses of 1960 and 1970, although there are some changes. For example, the question of Spanish origin (a 5-percent sample item in 1970) is asked of all households in 1980. There is only one set of sample questions. The sample, however, is of every other household (50 percent) in places, counties, and minor civil divisions of less than 2,500 inhabitants and every sixth household (17 percent) elsewhere. This provides greater and more reliable detail for use by small governmental units.

SELECTED INSTRUCTIONS TO ENUMERATORS: 1850 and 1980*

Census of 1850—Wording Authorized by the Congress

"...All landlords, jailors, superintendents of poorhouses, garrisons, hospitals, asylums, and other similar institutions are to be considered as heads of their respective families, and the inmates under their care to be registered as members thereof, and the details concerning each designated in their proper columns.

...The assistant marshal should ascertain if there be any person in the family deaf, dumb, idiotic, blind, insane, or pauper. If so, who?

...When persons who had been convicted of a crime within the year reside in families on the 1st of June, the fact should be stated, as in the other cases of criminals; but, as the interrogatory might give offense, the assistants had better refer to the county record for information on this head, and not make the inquiry of any family. With the county record and his own knowledge he can seldom err."

Census of 1980—Wording Authorized by the Census Bureau

"Question 19 Does this person have a physical, mental, or other health condition which has lasted 6 or more months and which *Limits* the kind or amount of work this person can do.

...the term "health condition" refers to any physical or mental problem which has lasted for 6 or more months. A serious problem with seeing, hearing, or speech should be considered a health condition. Pregnancy or a temporary health problem such as a broken bone that is expected to heal normally should not be considered a health condition.

...the term "kind of work" refers to the type of job that the person is able to hold.

...the term "amount" refers to the actual time this person is able to work.

Mark "Yes" if a health condition limits this person in the kind or amount of work he or she can do at a job or business."

*In 1850 the entire set of instructions to enumerators consisted of about three printed pages, with brief explanatory comments relating to the items on the schedule. In 1980 instructions to enumerators are provided in the *Questionnaire Reference Book*. This is a 200-plus page volume that contains not only detailed instructions relating to each item but also information to assist the enumerators in answering questions.

AN OUTLINE OF EVENTS IN CENSUS HISTORY

1790 --- First census of population

1800 --- Census headquarters moved from New York City to Washington, D.C.

1810 --- Beginning of census of manufactures.

1830 --- Uniform printed schedules were supplied.

1840 --- First census of agriculture;
First census of mineral industries.

1849 --- Responsibility for the census moved from the Department of State to the Department of the Interior.

1850 --- The individual became the unit of enumeration rather than the family;
First census of governments;
Black persons enumerated as a separate group.

1860 --- American Indians enumerated as a separate group;
Data collected on Chinese.

1870 --- Data collected on Japanese;
Presentation of results using maps (Statistical Atlas of the United States);
Women included in the labor force count.

1872 --- Use of mechanical tallying machines (Seaton Device).

1880 --- Supervisors and enumerators replaced marshals and assistant marshals as census takers;
First women enumerators;
Pledge of confidentiality required of enumerators.

1890 --- Introduction of electric machine tabulation (Hollerith);
American Indians on reservations or Indian Territory included in the official population count.

1902 --- Census office established as permanent agency.

1903 --- Census office attached to Department of Labor and Commerce.

1910 --- First presidential proclamation on the census (William Howard Taft);
Census tracts outlined in New York City.

1913 --- Bureau of the Census located in the Department of Commerce.

1915 --- First special enumeration for a local government (Tulsa, Oklahoma).

1930 --- First census of construction, retail trade, and wholesale trade.

1933 --- First census of selected service industries.

1940 --- Introduction of scientific sampling techniques;
First census of housing.

1942 --- Initiation of Current Population Survey.

1943 --- The Bureau moved into its current headquarters at Suitland, Maryland.

1951 --- UNIVAC-I put to use for census tabulating.

1953 --- Development of FOSDIC.

1954 --- Beginning of Integrated Economic Censuses Program.

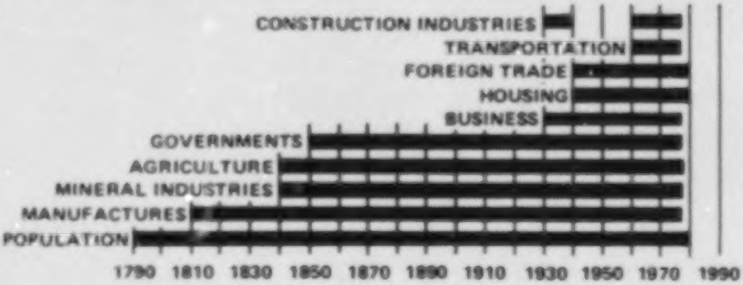
1960 --- Self-enumeration begun in densely settled areas;
Self-classification of race in the census of population;
Entire census tabulated by computer.

1963 --- First census of transportation.

1970 --- Extensive use of mail-out, mail-back procedure for population and housing census.

1973 --- Beginning of Annual Housing Survey.

FACTFINDER for the Nation: 1790 to 1980



FACTFINDER FOR THE NATION

Many decades of collecting data have brought a wealth of experience to the Bureau of the Census, and for several reasons it is especially qualified to be the Nation's major factfinder.

It has established a reputation for trustworthiness, and people generally are willing to give it accurate and confidential information.

The Bureau collects data throughout the country, from year to year, and from one generation to the next; consequently, its statistics for different areas or time periods are useful for comparative study.

The Bureau has developed an extensive program for consulting with users of its statistics, primarily through advisory committees, conferences, and workshops in which the latest methods of handling census materials are studied to assure that the statistics are widely useful.

The Bureau's staff, which includes demographers, geographers, statisticians, mathematicians, economists, computer specialists, and members of other professional fields, has an international reputation for expertise in factfinding. Since 1946, the Bureau has provided training for hundreds of persons from statistical organizations in other parts of the world. It consults regularly with statistical agencies in other countries to take mutual advantage of the latest techniques being developed in the United States and abroad.

After 19 censuses, the Bureau of the Census has come to be respected as a truly professional organization. Chapter 2, "Behind the Numbers," introduces the people who are continuing, and improving upon, the factfinder tradition.

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Chapter 2

BEHIND THE NUMBERS

Although the census itself dates back to our Nation's founding, there hasn't always been a Census Bureau. As described in the previous chapter, early censuses were conducted by staffs that were temporarily established and then disbanded after the enumeration was completed and the results were published. During the 19th century, it became obvious to most observers that this *ad hoc* form of census taking was inadequate in several respects: (1) there was usually a lack of continuity and experience in census work within the meager staff; (2) there were frequent legislative delays, which caused the census-taking process frequently to be organized in great haste; and (3) other inquiries were added increasingly to the already burdensome load of a complete enumeration of the population (i.e., the census of manufactures in 1810, the censuses of agriculture and mineral industries in 1840, and the census of governments in 1850). These factors often resulted in statistics of limited accuracy.

The idea of a permanent census organization was first suggested in the middle 1800's. One of the more outspoken proponents was James DeBow, census superintendent in 1854.

> Every 10 years someone at Washington will enter the hall of a department, appoint 50 or 100 persons under him, who, perhaps, have never compiled a table before, and are incapable of combining a column of figures correctly. Hundreds of thousands of pages of returns are placed in the hands of such persons to be digested. If any are qualified it is no merit of the system . . . . The establishment of a regular statistical office is therefore suggested, as a matter of economy, and essential to the proper execution of the census.[1]

Nevertheless, it was not until the 1880's and 1890's that the findings of a number of governmental, congressional, and professional organizations gave impetus to the creation of a permanent and professional Bureau of the Census. Finally, in 1902 Congress passed legislation that established a continuing organization within the Department of the Interior (where the census had been located, on an intermittent basis, since 1849). It remained in the Department of the Interior only until the following year (1903) when it was moved to the newly created Department of Labor and Commerce. There it stayed until 1913, when Commerce and Labor were separated. At that point, the Bureau of the Census was attached to the Department of Commerce where it has remained. Development of a permanent professional staff characterizes the modern era. This chapter introduces the people "Behind the Numbers"—the staff of the Census Bureau, their facilities, and their organizational structure.

THE PEOPLE OF THE BUREAU

The Bureau of the Census has been a permanent agency of the Federal Government since 1902. Among other features, this continuity has provided clear benefits in the form of a trained and experienced staff. Starting with only a few clerk-statisticians and their support personnel, the Bureau has grown steadily in response to the increased demands for data and services by all users.

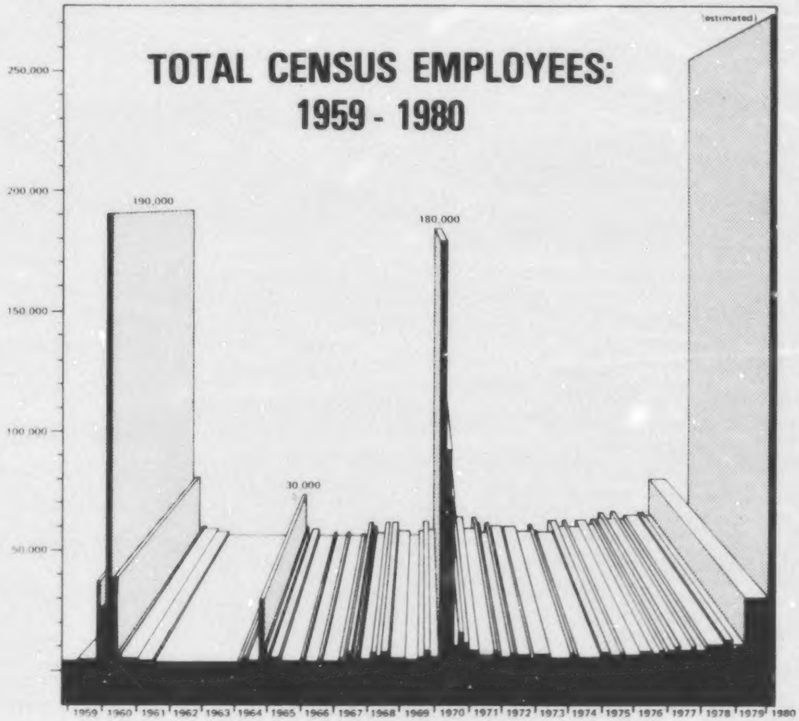


Figure 2-1. TOTAL CENSUS EMPLOYEES: 1959 - 1980

To demonstrate the Bureau's growth in recent years, fig. 2-1 presents a summary of the monthly total employment records for the period between January 1959 and June 1979. From the figure it is obvious that there are enormous personnel requirements at the times of the decennial censuses of population and housing. One can also see an increase in the number of personnel needed at the times of the agriculture and economic censuses.

Extreme fluctuations in employment such as those caused by the timing of the several periodic censuses present an unusual management and administrative problems. Not only must the Bureau recruit thousands of people from all over the Nation, but it must also provide them with intensive training and supervision so they can perform their tasks effectively and accurately. For census enumerators, many census tasks must be accomplished in the space of a few weeks.

Figure 2-2, which is also taken from the monthly employment records for the period between January 1959 and June 1979, focuses on the development of the staff at the Suitland, Md. headquarters. There has obviously been a great deal of growth over the 20 years, but it has not occurred evenly.

The variability in the Census Bureau's labor force is not only interesting but also perhaps unique among Federal agencies. Employment is composed of three major categories: (1) Professional and clerical staff; (2) permanent enumerators; and (3) temporary supervisors, enumerators, and clerks. The professional and clerical staff consist of those employees at the Suitland, Md. headquarters and in the regional offices and other outlying facilities who work on a permanent basis performing the work of the Bureau. The second group is represented by enumerators across the country who collect the data for the Bureau's surveys (e.g., the Current Population Survey and the Annual Housing Survey). Many of them work 1 week a month for 10 or 20 years. The final group is composed of those persons who are employed on a temporary basis to work on a particular program such as the 1980 census.

It is impossible to list all of the positions that exist in this large organization or to describe the particular qualifications that are required for each one. The Census Bureau employs statisticians, economists, demographers, sociologists, and people with social science specializations. It also has opportunities for specialists in electronic data processing, as it is a large-scale user of data-processing equipment. The administrative divisions include people with business administration, social science, public administration, and liberal arts backgrounds in such fields as finance, personnel, publications, management analysis, and administrative services. To provide a closer look at the people who make up the Census Bureau, a brief

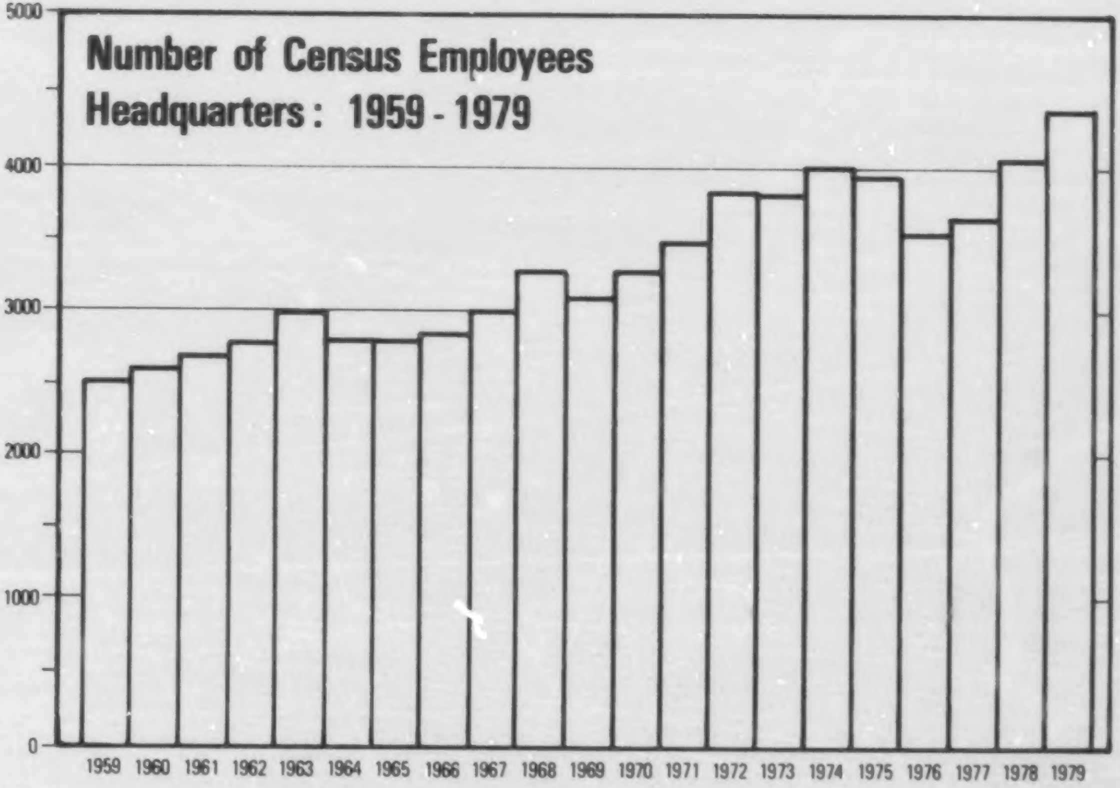


Figure 2-2. NUMBER OF CENSUS EMPLOYEES, HEADQUARTERS: 1959 - 1979

description of some of the professional fields and supporting technical specialties is in order.

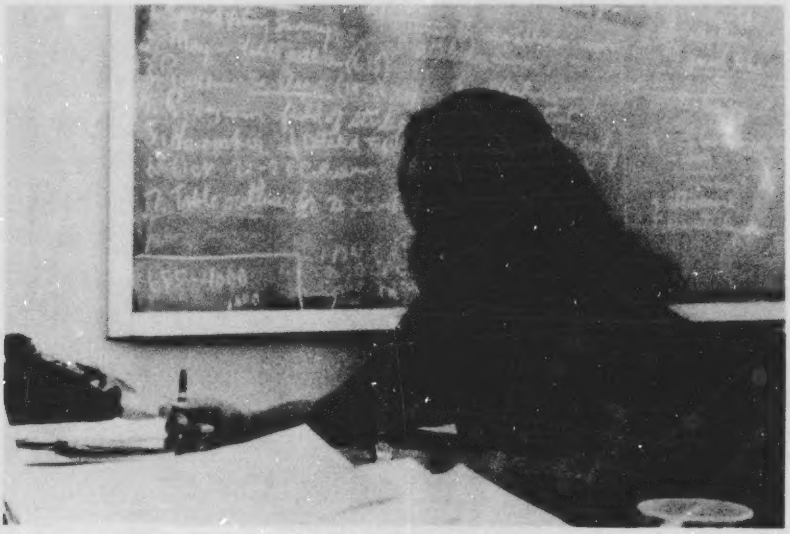
Population, Housing, and Other Demographic Areas

Demographers, statisticians, and social science analysts keep in touch with users of demographic data through advisory committees, professional organizations, conferences, and correspondence. They determine what information is needed by both general and specialized users and how it can be presented to the best advantage of each. They plan the censuses and surveys, develop questionnaires, and analyze the resulting data for potential value to specialized users. This work includes the Census of Population and Housing, the Current Population Survey, the Annual Housing Survey and the National Crime Survey, to name just a few. Statistical tabulations, analyses, and technical papers are also prepared by them to suit the needs of users as well as to advance the state of knowledge in their field.

PUERTO RICO

Business, Industry, Foreign Trade, and Other Economic Areas

Economists, social scientists, statisticians, and others with interests and expertise in these fields keep informed about the various uses of economic data through advisory committees, professional and trade associations, conferences, and correspondence. They are involved in a wide variety of censuses and surveys that cover manufactures, mineral industries, construction, wholesale trade, retail trade, transportation, and service industries. In addition, the censuses of agriculture and governments, along with the statistics on foreign trade, provide rich sources for the special statistical tabulations, analyses, and reports they prepare.



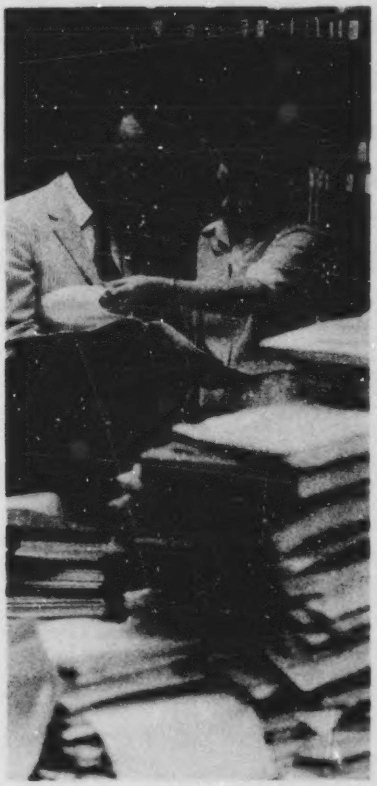
Statistical Methods

Pioneering research efforts at the Bureau of the Census have led to the development of standard techniques in scientific sampling and many other advances with impact far beyond the activities of Census.

The mathematical statisticians and others in this research and development area conduct research in statistical, economic, and related fields to develop improved techniques, procedures, and equipment. They formulate statistical standards to be applied in current operations, and they monitor current operations to assure the statistical validity of the product.

Geography

Geographers at the Census Bureau help define data sources in geographic terms. To a significant extent, this determines how the data are gathered, how they are to be processed, and how they can be used. Their work involves, on the one hand, maintaining maps that accurately reflect the administrative areas into which the Nation is divided, the boundaries of which change every time a city incorporates additional land. On the other hand, it involves defining statistical areas that will make the data-gathering operations appropriate to the myriad of uses to which the data are put. Census geographic operations also include developing computerized geographic references and using these reference files and electronic computers



to assign geographic codes to census and survey records. Bureau geographers also produce display maps, graphs, and charts using both manual and automated methods. Because this process is related to computer programming, the needs of data users, and the process of data collection, the Bureau's geographers and cartographers are people with a variety of talents and aptitudes.

Engineering, Systems Development, and Computer Services

Systems developers keep abreast of changes in methods and equipment, design and evaluate major processing systems, and work out solutions to individual problems encountered in processing operations. Applications programmers develop systems and write programs for specific projects. Systems programmers develop software systems. Engineers and technicians design and build specialized equipment and modify commercial equipment for the particular needs of the Bureau.

Management Analysis, Personnel, Finance, and Publications Management

Maintaining efficiency and high product standards require administrative people to use modern management techniques. The wide-ranging activities of the Bureau provide many challenges to administrative personnel in the agency.

Despite the regularity of many of its activities, the Census Bureau's work is far from routine; for example, each census of population and housing differs significantly from the preceding one in terms of methodology, the data that are to be gathered, and, obviously, the number of people to be counted. Estimating budgets and preparing justifications for each census undertaking is an important part of the administrative work at the agency.

The demographers, economists, statisticians, engineers, and computer specialists are constantly wrestling with challenges that require innovation, and their efforts often result in new and unique kinds of work. Thus, the accurate definition of tasks and the efficient management of their performance are important managerial goals.

While the Census Bureau is based in the Washington area, its activities touch every part of the country. Putting together field staffs for the purpose of gathering data that may be collected once, monthly, quarterly, annually, every 5 years, or every 10 years involves unique recruiting, training, and managerial skills.

THE ORGANIZATION

The Bureau of the Census is organized according to the chart in fig. 2-3. The Director of the Bureau, who reports to the Chief Economist of the Department of Commerce, shares the administration of the Bureau with a Deputy Director. Reporting to the Director, through the Deputy Director, are six Associate Directors, the Public Information Office, the Office of Program and Policy Development, the 1980 Census Promotional Office, and the Data User Services Division.

The Public Information Office is responsible for maintaining contact between the Bureau and the public through the mass media. This is accomplished through the preparation and distribution of a variety of materials including press releases, magazine articles, filmstrips, and radio and television announcements. The Office of Program and Policy Development has the primary function of providing planning and coordination assistance to the Director's office regarding budget, program

Vincent P. Barabba

Director, Bureau of the Census (1973-1976, 1979-)

"The challange facing the Bureau of the Census today is not only to bring our data to the decision-makers . . . , but to find ways of presenting these data in . . . formats that are more timely and more comprehensive, easier to use, and yet no less accurate than have been our past products."

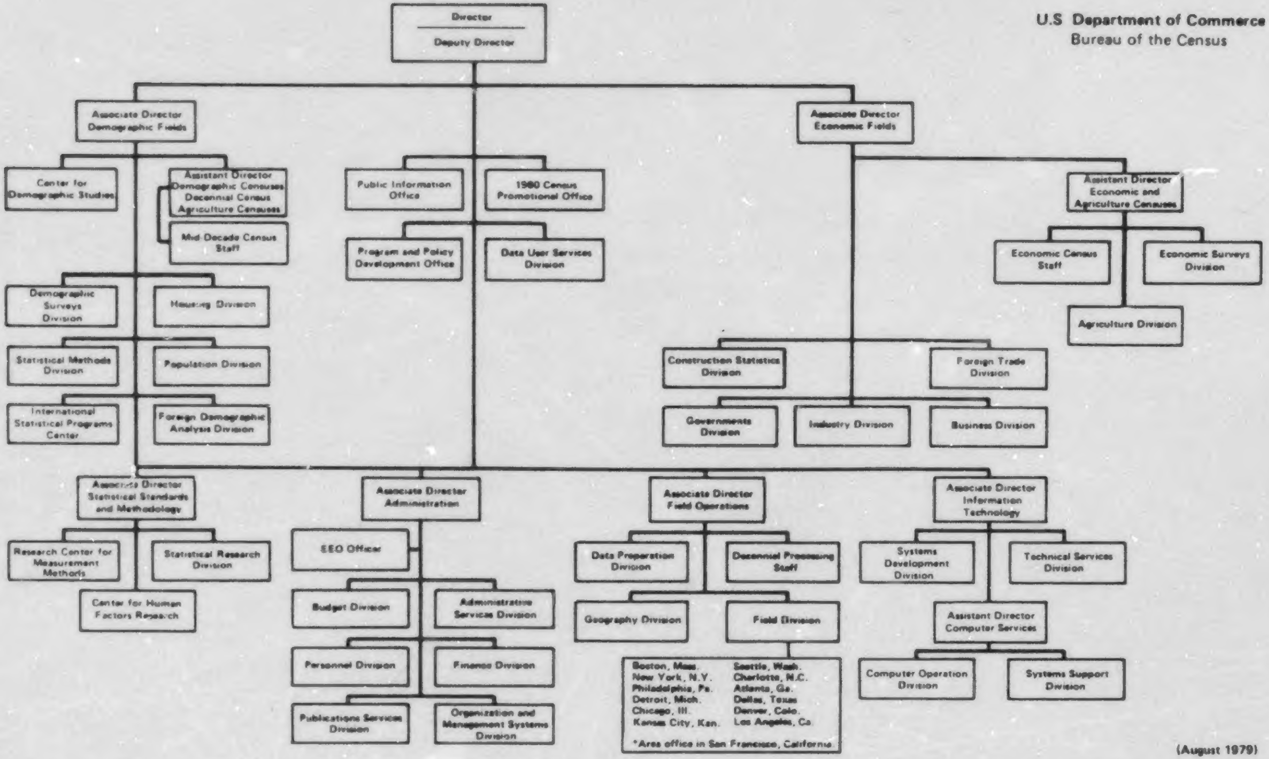

U.S Department of Commerce
Bureau of the Census
Director
Deputy Director
Associate Director Demographic Fields
Center for Demographic Studies
Assistant Director Demographic Censuses Decennial Census Agriculture Censuses
Mid-Decade Census Staff
Demographic Surveys Division
Housing Division
Statistical Methods Division
Population Division
International Statistical Programs Center
Foreign Demographic Analysis Division
Public Information Office
1980 Census Promotional Office
Program and Policy Development Office
Data User Services Division
Associate Director Economic Fields
Assistant Director Economic and Agriculture Censuses
Economic Census Staff
Economic Surveys Division
Agriculture Division
Construction Statistics Division
Foreign Trade Division
Governments Division
Industry Division
Business Division
Associate Director Statistical Standards and Methodology
Research Center for Measurement Methods
Statistical Research Division
Center for Human Factors Research
Associate Director Administration
EEO Officer
Budget Division
Administrative Services Division
Personnel Division
Finance Division
Publications Services Division
Organization and Management Systems Division
Associate Director Field Operations
Data Preparation Division
Decennial Processing Staff
Geography Division
Field Division
Boston, Mass.
New York, N.Y.
Philadelphia, Pa.
Detroit, Mich.
Chicago, Ill.
Kansas City, Kan.
Seattle, Wash.
Charlotte, N.C.
Atlanta, Ga.
Dallas, Texas
Denver, Colo.
Los Angeles, Ca.
*Area office in San Francisco, California
Associate Director Information Technology
Systems Development Division
Technical Services Division
Assistant Director Computer Services
Computer Operation Division
Systems Support Division
(August 1979)

Figure 2-3. CENSUS BUREAU ORGANIZATION CHART

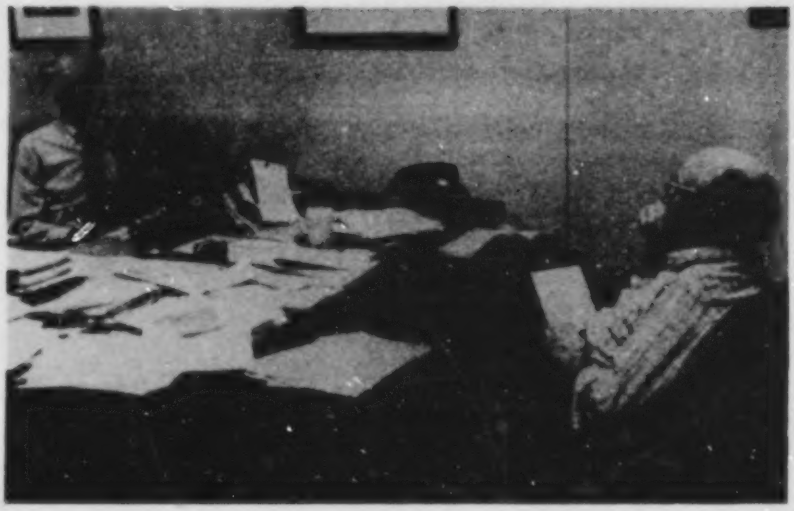
development, and program evaluation. Of particular interest is its Congressional Liaison staff, who monitor legislative developments, analyze all legislation with regard to its potential impact on the Bureau, and coordinate or prepare comments and testimony for congressional hearings. The responsibility of the 1980 Census Promotional Office is to develop and coordinate a national program to draw public attention to the importance of the decennial census of population and housing. The mission of the Data User Services Division is to help data users learn about, understand, acquire, and use the many Bureau services and data products. In addition, it produces statistical compendia (such as the *Statistical Abstract of the United States*) and a variety of other materials that provide data to the public as well as local governments and other organizations.

The Associate Directors are each responsible for a group of divisions that plan the content of the various censuses and surveys and the methods of operation, collect the data, perform processing and tabulating, prepare the results for publication, and carry out a variety of supporting functions. The offices of the Associate Directors are: Demographic Fields, Economic Fields, Statistical Standards and Methodology, Administration, Field Operations, and Information Technology.

Under the Associate Directors for Demographic Fields and Economic Fields are a number of divisions concerned mainly with the subject fields in which periodic censuses and surveys are taken. Most of the divisions under these two associate directors have a group of subject matter experts assigned to the planning and execution of the appropriate censuses and surveys. These specialists keep abreast of the needs of the users of census data, determine which proposals for the collection of new data are practical, and determine the priorities among the many competing claims. The divisions also have other specialists who are responsible for computer programming as well as for designing and preparing procedures for the collection of data.

The staff under the Associate Director for Statistical Standards and Methodology ensure that appropriate statistical methodology and techniques are applied to the fullest extent possible, not only to the Bureau's own censuses and surveys but also to the sizable amount of work that the Bureau carries out for other government agencies. Emphasis is placed on developing better methods for statistical operations such as sample surveys.

The office of the Associate Director for Information Technology is responsible for the maintenance and operation of all the Bureau's computing and tabulating facilities; preparation of generalized software (e.g., tabulating systems); engineering (FOSDIC); and systems programming consultation.



The divisions under the Associate Director for Field Operations are responsible for most of the Bureau's data collection and clerical processing operations. The Data Preparation Division, located in Jeffersonville, Ind., provides clerical and processing facilities for a wide range of census programs. It also prepares and distributes most of the supplies and equipment for the district offices during the decennial census. In addition, the Data Preparation Division is responsible for the Personal Census Service Branch, located in Pittsburg, Kans. The Decennial Processing Staff, directs the planning, organization and implementation of the programs to be used in processing the data collected from the 1980 Decennial Census of Population and Housing. The Field Division is involved in planning, coordinating, and directing the various field data collection programs of the Bureau, including both the decennial and other recurring censuses and the current surveys. In this context, reporting directly to the chief of the Field Division, are the 12 directors of the regional offices, who are responsible for implementing the various data collection and other programs in their regions.

As indicated in fig. 2-1, the decennial census is only one of the major responsibilities of the Bureau of the Census. The Bureau also conducts other periodic censuses (e.g., agriculture, manufactures, retail trade) and numerous surveys, including a variety of special surveys for various other agencies of the Federal Government. To carry out these data collection projects the Bureau has 12 regional offices throughout the country. The areas covered by these offices are shown in fig. 2-4 and their organizational structure is outlined in fig. 2-5.

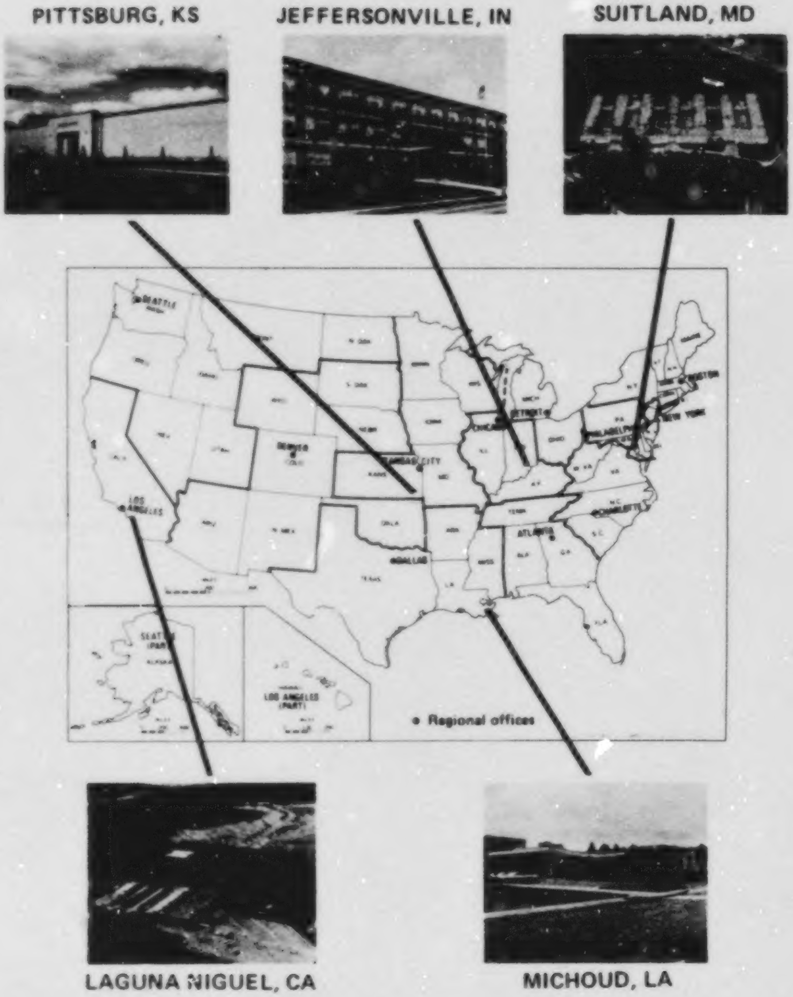

PITTSBURG, KS
JEFFERSONVILLE, IN
SUITLAND, MD
SEATTLE
BOSTON
NEW YORK
PHILADELPHIA
DETROIT
CHICAGO
KANSAS CITY
DENVER
LOS ANGELES
DALLAS
ATLANTA
CHARLOTTE
SEATTLE (PART)
LOS ANGELES (PART)
● Regional offices
LAGUNA NIGUEL, CA
MICHOUD, LA

Figure 2-4. MAJOR CENSUS BUREAU OFFICES AND FACILITIES

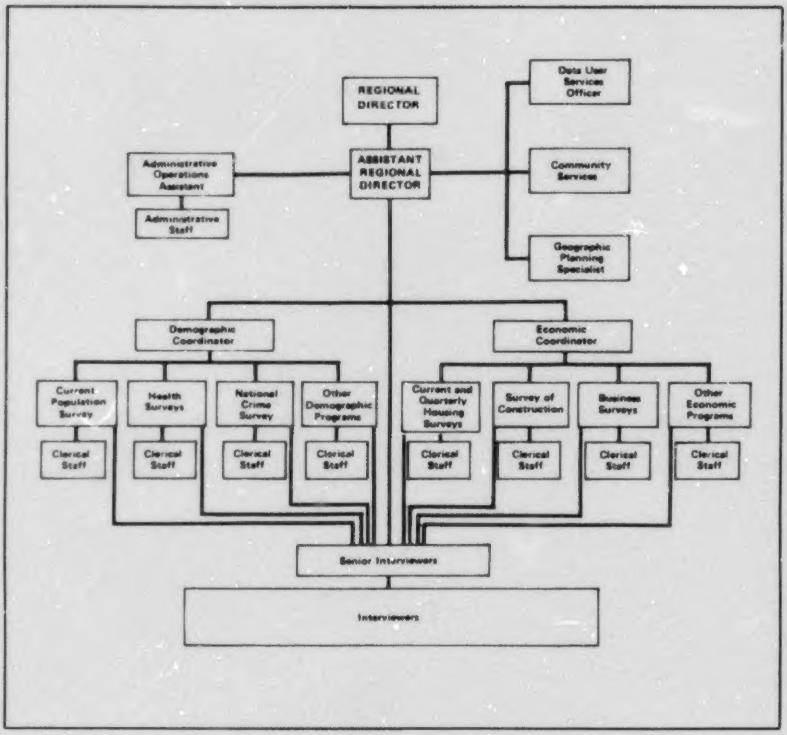
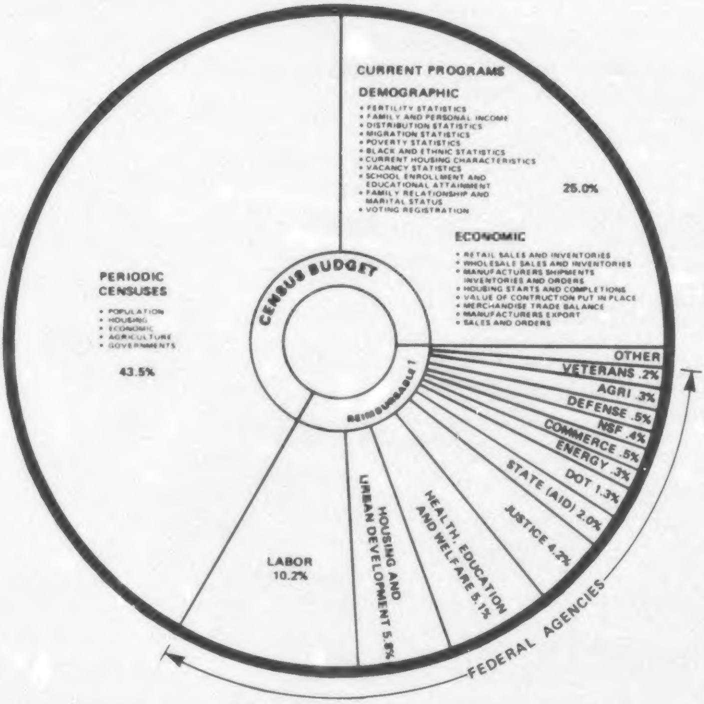

REGIONAL DIRECTOR
Data User Services Officer
Administrative Operations Assistant
ASSISTANT REGIONAL DIRECTOR
Community Services
Administrative Staff
Geographic Planning Specialist
Demographic Coordinator
Economic Coordinator
Current Population Survey
Health Surveys
National Crime Survey
Other Demographic Programs
Current and Quarterly Housing Surveys
Survey of Construction
Business Surveys
Other Economic Programs
Clerical Staff
Clerical Staff
Clerical Staff
Clerical Staff
Clerical Staff
Clerical Staff
Clerical Staff
Clerical Staff
Senior Interviewers
Interviewers

Figure 2-5. REGIONAL OFFICE STRUCTURE

During the decennial census, a large number of additional personnel are hired to coordinate, supervise, and execute the census activities in the regions. This necessitates the establishment of a separate organizational structure that is responsible only for the taking of the census. This organizational structure and the personnel involved are discussed in chapter 9.

A BRIEF LOOK AT THE BUDGET

The first decennial census of population—in 1790—cost a total of $44,377.28. It took fully 2 years from start to finish, including the planning, data collection (18 months), processing, tabulation, and publication of the results. The outcome was one volume of statistics, 56 pages long, for a total population of just under 4 million. By contrast, it is estimated that the 1980 Decennial Census of Population and Housing will carry a price tag of more than $960 million.

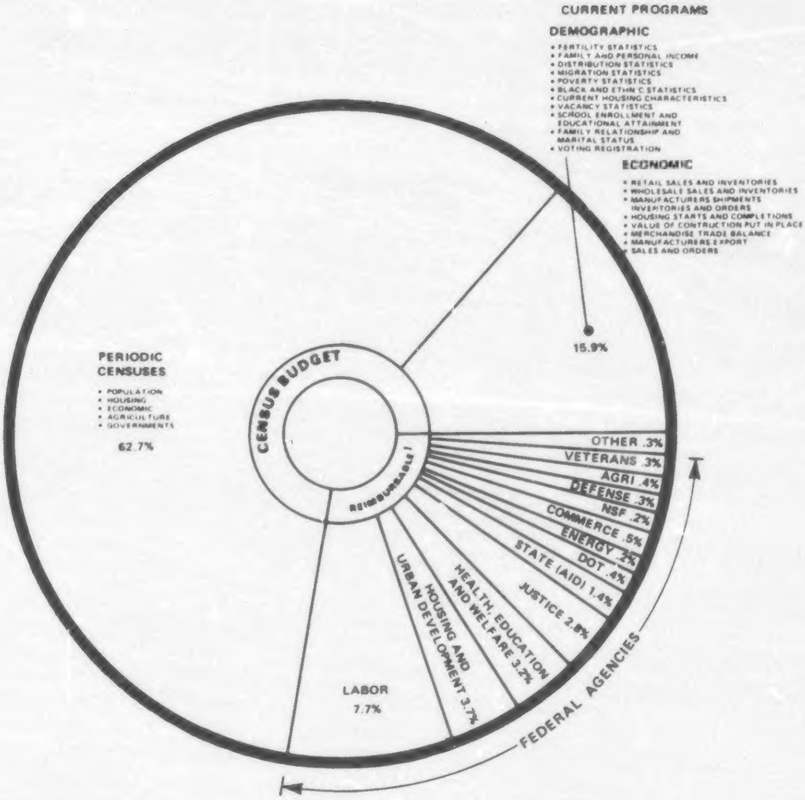


[1] SERVICES RENDERED - PAID FOR BY OTHER GOVERNMENT AGENCIES.

Figure 2-6. THE CENSUS DOLLAR – 1978

Accounting for all phases of the process (i.e., planning, preparation, data collection, processing, tabulation, evaluation, analysis, and publication), the census should take more than 9 years (from July 1973 to September 1983), and is expected to produce more than 250,000 pages of printed reports, plus hundreds of computer tapes and other products. The total population of the nation is expected to be about 222 million.

The decennial census of population and housing, however, is only one of the many activities of the Census Bureau. Figures 2-6 and 2-7 offer a clearer look at the Bureau's many activities and what they cost. Commonly known as "pie charts" because of their shape and the fact that each "slice" represents a portion of the total "pie," they represent the total cost of the Census Bureau to the public during the fiscal years of 1978 ($190.3 million) and 1979 ($322.3 million).



[1] SERVICES RENDERED - PAID FOR BY OTHER GOVERNMENT AGENCIES.

Figure 2-7. THE CENSUS DOLLAR – 1979

In both charts, there are three major budget categories: periodic censuses, current programs, and reimbursables. The first of these categories, of course, includes the expenditures for the decennial census of population and housing. This is why the periodic census share of the total census dollar grows as it approaches the time of the actual enumeration, from 43.5 percent in 1978 to 62.7 percent in 1979. In 1980, this category will comprise almost 85 percent of the total. Similar fluctuations in this category also occur in conjunction with the other periodic censuses. They are, however, much less striking. This is due largely to the fact that the other periodic censuses (e.g., economic censuses) rely on information from administrative records to a far greater extent and thus require only a fraction of the staff and facilities necessary for a complete enumeration of population and housing units. Nevertheless, in the future, when all other periodic censuses will be taken in years ending in "2" and "7" their impact on the annual budget will be clearly perceptible.

The category of Current Programs refers to the many demographic and economic statistics that the Census Bureau collects, analyzes, and reports on a continuing basis. An interesting fact emerges from the comparison of the two pie charts with respect to this category. The current programs' *share* of the total census dollar dropped between 1978 and 1979, which was due entirely to the substantial increases in appropriation for the periodic censuses. In fact, the *amount* appropriated for current programs increased from $47.6 million in 1978 to $51.1 million in 1979.

The last of the three budget categories is the reimbursables. This refers to work of one sort or another that the Census Bureau does for various other U.S. Government agencies (e.g., the Annual and Quarterly Housing Surveys for the Department of Housing and Urban Development, or the National Crime Survey for the Department of Justice). These surveys and other work represent a substantial portion of the Bureau's total dollar: 30.8 percent or almost $60 million in 1978 and 21.4 percent ($69 million) in 1979.

There is one other statistic that is represented as "other" under reimbursables in figs. 2-6 and 2-7 that should be noted at this point. The Census Bureau provides services and carries out a variety of projects for many individuals, businesses, organizations, and local governments that are not included in the Federal appropriation. Examples include special censuses conducted for local governments and preparation of customized tabulations for clients whose needs are not met by the standard products. These are all performed on a cost basis and represent a small but growing portion of the funds available to the Bureau. The costs of gathering, analyzing, and reporting census data are not small, but in return, accurate and current information necessary to the administration of a complex society is provided.

LOCATIONS

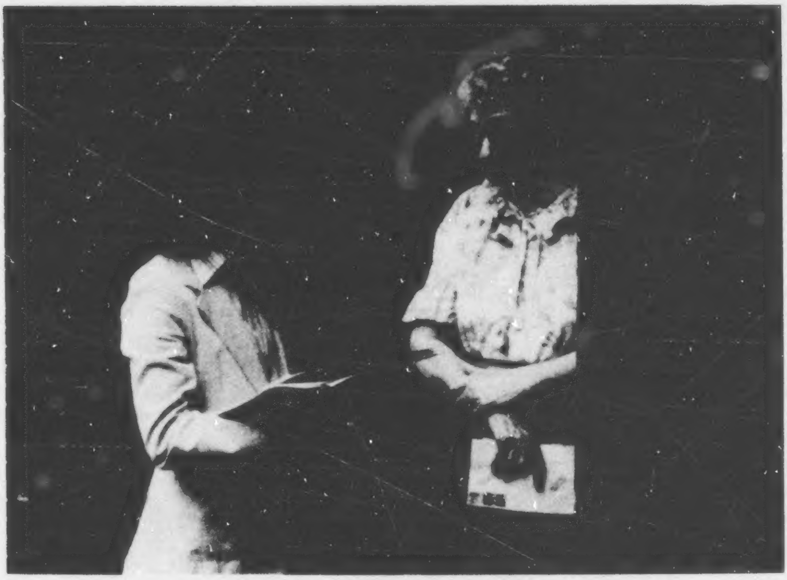
A Migratory Existence

The Bureau of the Census and its predecessor, the intermittent Census Office, have led a migratory life. The first census of 1790 was taken from a headquarters on the east side of Broadway in New York City. This was the only census headquarters to be located outside the Washington area. Headquarters for the censuses of 1950, 1960, and 1970 were in Suitland, Md., located just outside Washington, D.C., about 5 miles southeast of the Capitol. In between, there have been an assortment of census headquarters buildings.

Today the location in Suitland, Md. appears to be the permanent headquarters of the Bureau of the Census. In addition, as noted above, the Bureau has 12 permanent regional offices throughout the Nation, plus installations in Jeffersonville, Ind., and Pittsburg, Kans. The regional offices carry out the Bureau's many data-collection efforts, and the Jeffersonville facility is responsible for processing those data so that they can be analyzed at the Suitland headquarters, where most of the computer processing is done as well. The facility at Pittsburg is the Bureau's decennial census "questionnaire" depository, where a staff handles the thousands of requests by individuals for information about themselves (to qualify for social security or retirement benefits, to obtain a passport, and so on). Recently, the Bureau has also acquired the temporary use of two other installations, one outside of New Orleans, La., the other at Laguna Niguel, Calif. The personnel at these facilities will assist those at Jeffersonville in processing the questionnaires from the 1980 Censuses of Population and Housing (see fig. 2-4).

ENUMERATORS

To a large extent the Bureau's labor force is composed of temporary personnel who are employed, in most instances, for only a few weeks (see fig. 2-1 on total employment). The various periodic censuses require the temporary employment of enumerators as well as clerical help. Hundreds of thousands of people from all over the Nation have assisted the Bureau in its



work. For the 1980 Census of Population and Housing alone, the Bureau must recruit, test, hire, train, supervise, and pay over 250,000 people—the majority as enumerators. These employees come from all over the Nation—Alaska to Florida, Maine to Hawaii. There are men and women of all ages,

The enumerators have to go where the people are.

creeds, and colors, some working over the telephone, others in the field. Their common goal is to carry out the most complete and most accurate census in the Nation's history.

It is inevitable that over the years such a large number of people occupied at the same task would have some interesting stories to tell. The pages that close this chapter recall census takers' experiences during the last four censuses (1940, 1950, 1960, 1970). All of the information is factual.

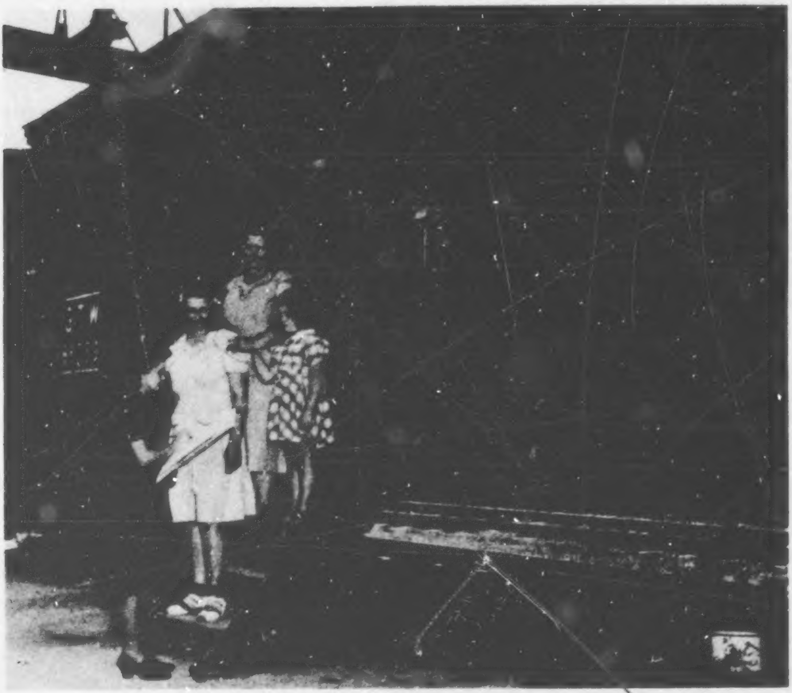
Enumerators' Anecdotes

Census takers walk in on births and deaths, family quarrels, and household emergencies. They find themselves hanging out the wash, changing diapers, and joining bucket brigades to fight house fires. They are chased by dogs, goats, roosters, enraged bulls, and irate householders. They are invited to stay for dinner, to view the family album, and admire Sonny's collection of Indian arrowheads. They find themselves dealing with proposals of marriage and being kissed goodnight, along with the parents, by the children.

Census takers make their rounds on foot, by car, on horseback, outrigger canoe, airplane, helicopter, snowshoes, skis, snowcats, motorboat, rowboat, or whatever means of travel is available and necessary to reach every household.

One Montana census taker reported he had been covering his territory entirely by saddle horse. Another said he had resorted to bobsleds and skis to get around. And in Hawaii, it was common for census takers to go by outrigger canoe to visit villages along the shores of islands.

They find people living in converted chicken houses, tin huts, old boxcars, caverns, packing crates, mine tunnels, barn lofts, and old street cars. One family was located in an armory; another family of six were found in a boarded-up basement. Sometimes, houses are even occupied by one set of people by day and a different set by night.



People live in many different types of housing units.

Most census takers enjoy the work and many have said they would not take anything for the experience. One young woman wrote:

> The 1970 census is meeting the needs of changing America... I'll remember that I was a part of it.

Many a census taker has found that census taking is not all census taking, however. One found herself acting as midwife at an isolated farmhouse. There was no time to take the mother to the hospital and the baby was about to be born. So, she took charge and delivered the infant. Another census taker was enumerating the household of a minister when a couple arrived wanting to be married. The census taker stopped his work long enough to serve as a witness to the ceremony. In another case, the wife had just returned from the hospital with a new baby. The infant was crying, three other children were hungry, and the house was in a mess. The census taker called her crew leader and together they calmed the frantic mother, fed the children, cleaned the house, and then took the census.

Census takers occasionally receive some strange answers to their questions. In 1960, one woman insisted she was born in 1815. She was not 145 years old, but she knew she was born in 1815. A man remembered George Washington, or so he said. Another man said he was born on Mars, but when pressed for details said he reckoned it might have been Kansas. One woman gave her age as 38 and her son's as 33.

A South Carolina minister, serving as a census taker, hit a bit of a snag when he tried to enumerate a chain gang. He was locked in for 3 hours. It seems that, while the minister was doing his job, a change of the guard took place. Unconvinced that the so-called Reverend was not an inmate, the guard wouldn't let him out until the warden (who was out frog-gigging) returned to the jail 3 hours later.

Sometimes, the census taker arrives in time to save a life or prevent a tragic accident. In response to one census taker's knock, a 77-year-old woman opened the door. She had crawled across the floor from the side of her husband, who was lying on the floor. The census taker summoned help and the couple was taken to the hospital where it was discovered that they had been stricken with food poisoning and had been without food or water for 3 days. After they had recovered, the census taker visited them again to obtain their census information.

In another case, the man's feeble voice asked the census taker to climb in the window. She did and found an 85-year-old man lying helpless on the floor. He motioned to the next room and said, "My census form is in there. It's all filled out." The census taker got him into bed and called a doctor.

Just outside St. Louis, another enumerator had to conduct an "in-depth" interview with one man. It turns out he was a stuntman trying to break the

In some places, enumerators reach people the same way they did in 1790.

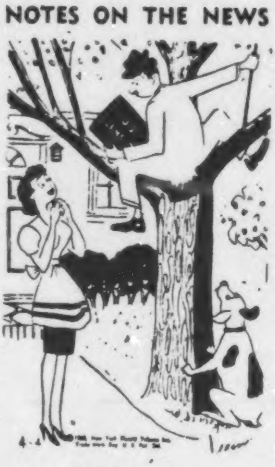
world record for being buried alive—in a 3 foot wide by 6 foot long home, 3 feet underground.

Census takers are always grateful for the help so many citizens give them, like the Idaho residents who came into town on horseback, tractor, even snowshoes to meet the census taker and be counted. Or like the man who came out of his cabin on showshoes to wait by the road for the census taker so he would be sure to be counted. He asked the census taker in for hot coffee, biscuits, and mulligan stew.

As one Montana census taker observed, "There are so many courageous interesting people happily struggling to make a living in this beautiful, healthful region." "I'm so glad to see you," enthused one lady when she opened the door for the enumerator. "I've kept my good corset on for 3 days while I've been waiting."

As one astute enumerator observed, "It's not difficult to get the census information. The difficulty is in cutting off the flow of information that has nothing to do with the census." It is a common experience for a census taker to be invited to stay for a meal. One said she had been invited to dinner nine times and asked by several families to come back for a visit after the census. "One lady was especially glad to see me. I was her first visitor in more than 2 years," she said.

Some people, while not actually uncooperative, still don't want to stop their work to answer census questions. The Texas farmer said he had to get the



"He thought you were the mailman!"

Census takers occasionally run into situations where they need help.

© Whitney Communication Corp. Used by permission.

field plowed that day and couldn't stop his tractor to be interviewed. The census taker said all right, she'd fire a question at him each time he passed and he could answer. He agreed. It took 2 hours and the census taker wound up with a sore throat and a sunburn . . . but she got all the answers.

Some rural people are totally unaware of the big count. One enumerator in West Virginia approached an elderly woman leaning on a hoe. The woman asked the census taker the purpose of the visit. "Every 10 years," the enumerator patiently explained, "the Government tries to find out how many people there are in the United States." The lady stared thoughtfully at the earth and then replied: "Lordy, honey, I sure don't know."

Like postmen, census takers must be ever wary of dogs. In their training they are instructed to stay in their cars (or at least out of the yard) if an unfriendly dog guards the house, and try to get the attention of the householder so that he/she can call off the animal.

In one area, the census taker had been warned by neighbors about a bad dog in a certain home. He gathered his courage, knocked on the door, and was admitted. After completing the interview, he told the lady of the house that he had been awfully nervous because of reports about her dog, which he hadn't even seen. "Oh," she said, "he only bites people as they are leaving."

Animals are not the only living creatures that are inhospitable to census takers. Humans are sometimes prone to be troublesome, too. One woman

Can You Match These?

The Census Bureau's 1970 Alphabetical Index of Occupations and Industries makes fascinating reading. Scanning the pages of occupations, one comes across uncommon and thought-tickling titles. Can you match them up correctly with their descriptions?

1. Twenty-six girl
2. Fifth-hand
3. Stiff-leg operator
4. Devil dog
5. Duck operator
6. Grizzlyman
7. Back washer
8. Upsetter
9. Finger closer
10. Tuck pointer
11. River rat
12. Bug Duster
13. Antisqueak man
14. Zigzagger
15. Donkey puncher

a. forging machine operator
b. works in glove factory
c. handles a duck-bill power shovel
d. operative in a textile mill
e. laborer in a paper mill
f. presides over dice games in a casino
g. brick or stone mason
h. operates a stiff-leg derrick
i. apprentice printer
j. miner
k. inserts lubricant material into car bodies
l. operates a machine for loading logs
m. laborer in a logging camp
n. operates a sewing machine
o. takes up the coal left by the coal cutting machine

Correct Answers to Titles Match:

1-f; 2-e; 3-h; 4-i; 5-c; 6-j; 7-d; 8-a; 9-b; 10-g; 11-m; 12-o; 13-k; 14-n; 15-l.

took out after a census taker with a fly swatter. Later as the same census taker approached a man washing his car, he sprayed her with water. She kept on talking in spite of the shower, and finally he gave her the information she needed.

In the case of an enumerator in Minnesota who was hit by an empty can, there was no malice intended. It seems the woman who threw it was aiming at her husband, but missed.

Census takers receive some unusual answers to the question, "What is your occupation?" At one home the family business was making caskets. Those who lined them said they were interior decorators.

Then there were the mouse farmer, snake doctor, subterranean architect, artificial limb breaker-inner, plumber's helper's helper, professional mourner, gum taster, rug cutter, golf ball winder, and the woman who said she was a pickpocket. "A legal pickpocket," she was quick to add, "I work in a dry cleaning plant and search pockets of clothing left for cleaning."

Census takers become accustomed to the unusual. A knock on any door may confront them with the unexpected. One census taker was speechless when she was greeted by a monkey chattering away in a aimiable manner. In another instance, the census taker and a farmer were sitting on the front porch. Just after the census taker came to the question, "Does this house need repairs?" the porch fell off the front of the house.

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Chapter 3

FACING SOME ISSUES

The vast majority of the American people accept the census as a necessary fact of modern life. When a questionnaire arrives in the mail or when the census enumerator knocks on their door, they usually cooperate; frequently, they go out of their way to be helpful. Nevertheless, some people have objected to the taking of the census. Some people have resisted it because they feared the use to which the information would be put. Some have objected to the census for diverse reasons including political motives, religious principles, the invasion of personal privacy, or its cost. Others have even questioned the need for a census in the first place.

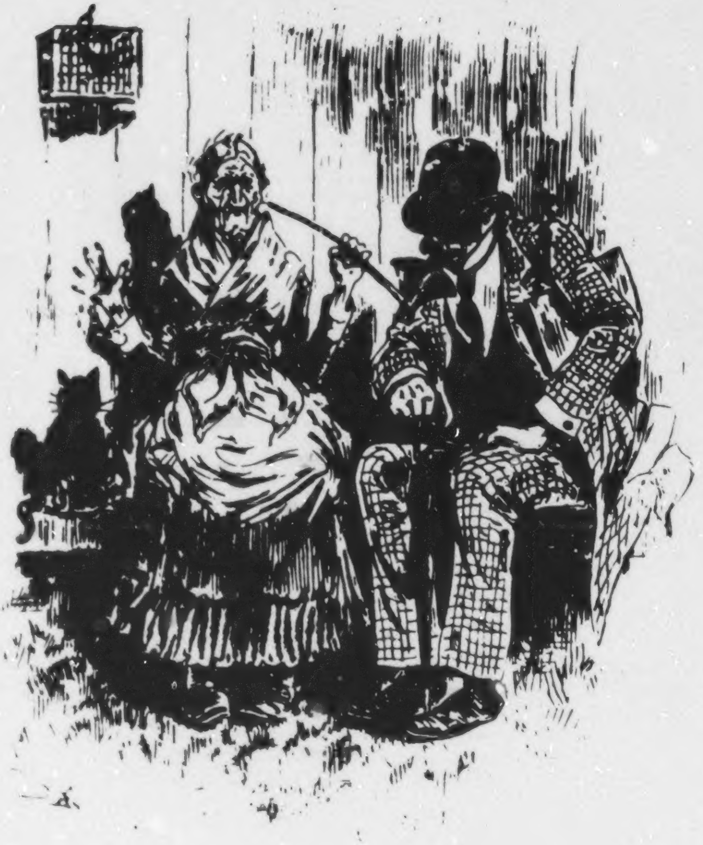
This chapter focuses on four census topics that, in recent years, have come to the center of public attention: (1) Privacy, (2) accuracy, (3) the relationship of census data to Federal funding formulas, and (4) cost. Each of these topics has claimed a great deal of public debate. Each involves complex issues that, unfortunately, preclude simple solutions.

PRIVACY

The specter of government intrusion into the affairs of individual citizens has always been a highly emotional subject and one often discussed in the framework of newspaper headlines. Events of recent years have brought the privacy issue to the level of public debate. Abuses, such as the military surveillance of civilians, wiretapping, and political espionage have raised fears so that even legitimate attempts to gain information, such as censuses, have been met with occasional suspicion. Reactions to the abuses include the assertion that each person has an inalienable right to total privacy. Such an extreme view is bound to collide head-on with society's need for information.

A Definition

What is the right of privacy? Is it something that can be brushed aside anytime a governmental organization believes it needs a new piece of infor-



THE CENSUS

CENSUS TAKER. "Good-morning, madam; I'm taking the census."

OLD LADY. "The what?"

C. T. "The c-e-n-s-u-s!"

O.L. "For lan's sake! what with tramps takin' everythin' thay kin lay their han's on, young folks takin' fotygrafs of ye without so much as askin', an' impudent fellows comin' roun' as wants ter take yer senses, pretty soon there won't be nothin' left ter take, I'm thinking."

Cartoon appearing in June 14, 1890 issue of *Harper's Weekly*. Courtesy: Library of Congress.

mation to assist the people it serves? The right to privacy is an easy term to evoke, but a difficult one to define.

American legal and academic scholars have wrestled with the problem of privacy since law students Samuel Warren and Louis D. Brandeis (later a Justice of the Supreme Court) published their article, "The Right To Privacy," in the *Harvard Law Review* in 1890. In that article they defined the right to privacy as the right to be left alone. After tracing its development through the history of common law, Warren and Brandeis developed their quasi-legal definition by viewing it as a "right" to be secure from undue interference with one's person, papers, property, or thoughts. In this view, there are echoes of the "self-evident" rights stressed in the Declaration of Independence.[1]

For the purposes of this discussion "privacy" refers to a sphere in which the individual is able to decide what will be transmitted to others. This sphere could be expanded to include certain confidential relationships where the individual believes that information transmitted, either by choice or compulsion, will go no further than the parties to that relation and will only be used for the purposes that were identified at the time the information was provided. The determination, through laws, that information can be elicited, what that information includes, and how it will be used is made by duly elected representatives of the people and thus comes about through "the consent of the governed."

Given the responsibilities of citizenship as well as the privileges, the right to "privacy" is not absolute. Privacy is not necessarily violated when a limited number of questions are asked on a mandatory basis, given the legality of the inquiry and the guarantee that the answers given will not be used for purposes other than what the respondent has been clearly told.

Confidentiality

Confidentiality must be considered when anyone attempts to assess or balance individual privacy and society's need to know. In current Census Bureau practice, the term "confidentiality" represents nothing less than a clear extension of an individual's right to privacy. Specifically, it relates to information about individuals that has come into the hands of the Census Bureau. In this context, it is important to make the distinction between personal information gathered for statistical purposes and that collected for administrative tasks. The information could be the same in both cases, but administrative records are intended to affect the individual directly (for instance, those used by the Internal Revenue Service or the Social Security system). Statistical records, in contrast, such as those maintained by the Census Bureau, do not directly affect the individual.

The Constitution is less than specific about many aspects of individual privacy. Yet, the courts have been able to find several guideposts for dealing with specific cases. The crux of the issue appears to be: As American society becomes more complex, we need to know more about ourselves to establish priorities and fairly allocate our human, financial, and natural resources. This "need to know" must be carefully balanced against the individual's "right to be left alone." In many ways, this right is similar to the Constitutional guarantee against unreasonable searches. It is the determination of what *is* reasonable to ask an individual that is difficult and, through the years, changeable.

Theory and Practice

The preceding statements about confidentiality merely represent a philosophical approach to matters of individual privacy and respondent-Census Bureau confidentiality. But, the Census Bureau must face the tough "real world" decisions involving these issues. For example, in the rural America of 1790, it would have been hard to justify the government's interest in how many rooms were in the house. Today, however, with society's commitment to eliminate slums and substandard housing, information about crowded conditions is needed to accurately pinpoint the number and general location of such housing units so the taxpayer's dollar can be spent effectively and efficiently.

Another illustration is the census question about how a person gets to work. In 1970 some people felt this information was not the Government's business. But, when the energy crisis of 1974 and again in 1979 hit with full force, the only complete statistics about the commuting habits in localities across the country came from the answer to that question. The Bureau was able to respond with statistics about the number of drivers, passengers, and users of public transportation for each metropolitan area.

These are brief examples of the kinds of questions that some people may feel are an unnecessary invasion of an individual's private sphere, but do, in fact, yield important information. Former Senator Sam Ervin, in his role as Chairman of the Subcommittee on Constitutional Rights, summarized the problem well:

> Somewhere a balance must be struck between the individual's desire to keep silent and the government's needs for information. If it is proved necessary to invade certain rights, clearly it is the constitutional duty of Congress to establish precisely how and under what circumstances this may be done.[2]

Congress has been doing exactly that for almost a century. Since the act that provided for the 1880 census, the laws protecting the confidentiality of the information given in response to census questions have been progressively strengthened. At the same time, what the Bureau can collect has been more carefully defined.

Confidentiality has not always been the case, though. In the first six censuses (1790 to 1830), Federal marshals were instructed to post copies of the completed enumeration sheets containing individual census information. This was to be done in two of the most public places within each jurisdiction, "there to remain for the inspection of all concerned. . .," so that changes çould be made for missing households or missing people.

Between 1840 and 1870 there were still no legal restrictions, but census takers in the field were instructed to treat all information they gathered as strictly confidential.

Beginning in 1880 the law required all enumerators to take an oath not to disclose any personal information. Oddly enough this requirement did not extend to their supervisors. That loophole was closed in 1900, when all census employees were made subject to a $500 fine for violation of their oath. The penalties today have been increased to not more than $5,000 or 5 years in prison. No Bureau of the Census or Department of Commerce employee has ever been convicted of violating this trust, a record of which the Census Bureau is justly proud.

Until 1910, census law required the Director to furnish, on a fee basis at the specific request of Governors or heads of municipal governments, certain parts of an individual's return (i.e., the name, age, sex, birth place, and race). Although there is no evidence of any general use of this service, the Act for the 1910 census changed that wording. Thus, the Director could, at his discretion, furnish information for genealogical and other proper purposes. The law for the 1910 census was also the first to pay attention to the possibility of inadvertently disclosing confidential information through published reports. Specifically, it directed that publications be prepared in such a way that the report of an individual business establishment would not be revealed (the population and agriculture censuses received similar protection in 1930).

The year 1910 marked the start of still another tradition—the Presidential proclamation on confidentiality. The proclamation issued by President Taft told the American people that their replies to census questions were to be used only to compile general statistical information, and that their answers were protected by law. In part, it read: "The census has nothing to do with taxation, with army or jury service. . .nor can any person be harmed in any way by furnishing the information required." Since that time, every decennial census has been accompanied by a Presidential proclamation reaffirming the bond of confidentiality.[3]

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

PROCLAMATION

Our Constitution requires that there be a census of the people in the United States once every ten years. The Twentieth Decennial Census will be taken beginning April 1, 1980.

It is vitally important to everyone that this census be a complete and accurate report of the Nation's population and resources. Its results determine the representation of the States in the House of Representatives, the redrawing of congressional boundaries, and State and local redistricting. They also provide the basis for distributing large amounts of funds under various Federal programs among the States and communities.

The census is also important for a broader purpose. Americans are a free and mobile people. Significant and rapid changes take place in our country. To better understand ourselves and make intelligent decisions for the future, we depend greatly on our census.

NOW, THEREFORE, I, JIMMY CARTER, President of the United States of America, do hereby declare and make known that under the law it is the duty of every person to participate in the census by answering all questions in the census schedule applying to him or her and the family to which he or she belongs, and to the home being occupied.

Every person in the United States can be sure that there will be no improper use of the information given in the census. Answers cannot be released in any way which will harm the individual. By law individual information collected will not be used for purposes of taxation, investigation, or regulation, or in connection with military or jury service, the compulsion of school attendance, the regulation of immigration, or with the enforcement of any national, State, or local law or ordinance.

IN WITNESS WHEREOF, I have hereunto set my hand this sixth day of November, in the year of our Lord nineteen hundred seventy-nine, and of the Independence of the United States of America the two hundred and fourth.

JIMMY CARTER

FREEDOM OF INFORMATION ACT

The Freedom of Information Act makes information held by Federal agencies available to the public unless it comes within one of the specific categories of matters exempt from public disclosure. The legislative history of the act (particularly the recent amendments) makes it clear that the primary purpose was to make information maintained by the executive branch of the Federal Government more available to the public. At the same time, the act recognized that records which cannot be disclosed without impairing rights of privacy or important Government operations must be protected from disclosure. Thus, the Freedom of Information Act does not apply to identifiable data collected for statistical purposes by the Census Bureau.

PRIVACY ACT OF 1974

The Privacy Act of 1974 reasserts the fundamental right to privacy as derived from the Constitution of the United States and provides a series of basic safeguards for the individual to prevent the misuse of personal information by the Federal Government.

The act provides for making known to the public the existence and characteristics of all personal information systems kept by every Federal agency. The act permits an individual to have access to records containing personal information on that individual and allows the individual to control the transfer of that information to other Federal agencies for nonroutine uses. The act also requires all Federal agencies to keep accurate accountings of transfers of personal records to their agencies and outsiders, and to make the accountings available to the individual. The act further provides for civil remedies for the individual whose records are kept or used in contravention of the requirements of the act.

Current Law

The current law under which the Census Bureau operates is very specific when it comes to the protection of personal information. It states: (1) The information gathered by the Census Bureau may be used only for statistical purposes; (2) the publication of the data must be such that neither establishments nor individuals may be identified; and (3) only sworn officers and employees of the Department of Commerce or the Census Bureau may examine individual reports.

This third restriction is spelled out even further. It stipulates that no governmental agency, officer or employee can obtain copies of census reports, and that census reports cannot, without the consent of the individual or establishment concerned, be admitted as evidence or used in any action, suit, or other judicial or administrative proceeding.[4] This restriction was tested in a court case in 1976 in which the IBM Corp. requested records from the Census Bureau for data collected from other corporations to prepare its defense in an antitrust case. The courts upheld the confidentiality of census records, and IBM was unable to obtain them.

Answers Are Required

From the first census, Congress has always included a requirement that the people answer the questions truthfully and to the best of their ability. Penalties have also been provided for those failing to comply. At first, the penalty was a fine of not more than $20 (a substantial amount in 1790). Later, a jail sentence was added. Today, the penalty is simply a maximum fine of $100, the jail sentence having been revoked by Congress in 1976.

The Census Bureau: *Airtight Against Snoopers*

THE OATH

Every employee of the Census Bureau, including temporary workers, must take an oath that he or she will not disclose any personal information, or information about a firm, which has been obtained in a census or survey conducted by the Bureau.

THE PENALTY

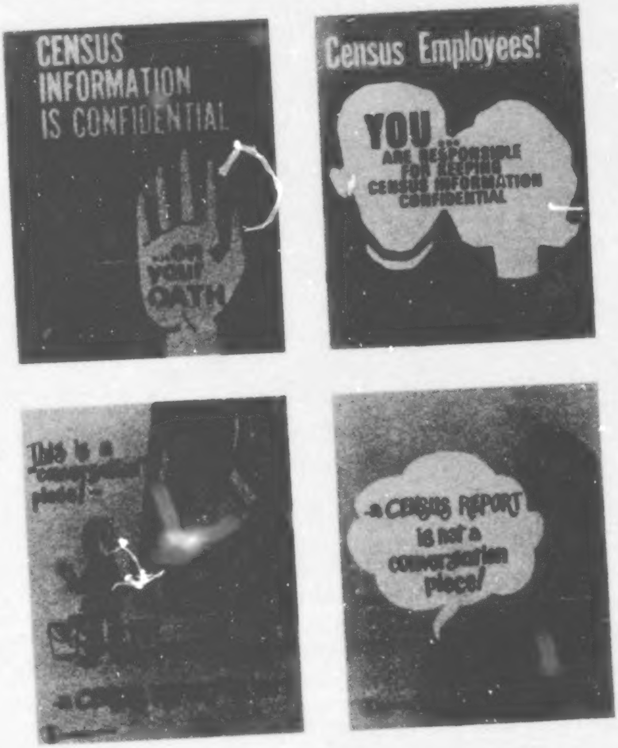
Violators of the oath are subject to severe punishment -- up to five years in prison, a fine of up to $5,000, or both. In fact, the spirit of the law is as much a deterrent as the letter since no Census Bureau employee has ever been convicted of violating the oath of confidentiality. Census employees are proud of their record as protectors of individual privacy.

THE RESULT

"There has never been a single claim substantiated that the Bureau of the Census has made individual information available outside the Bureau or that the Bureau has ever used any information received other than for authorized purposes."

Although the Census Bureau has authority for the mandatory collection of data from individuals and establishments, in actual practice the Bureau must depend not on its coercive power but on the willing cooperation of the public. While fines have been levied in a relatively few cases, there is no record of anyone being sent to jail for refusing to answer census questions, when jail was a penalty for noncompliance.

Although the overwhelming majority of the U.S. population cooperates with Census, there are a few individuals who refuse to answer at least some of the questions. Refusals date back to the first census: "In September 1791, the grand jury of the Federal district court for Charleston S.C. made a report against six persons for refusing to render an account of persons in their families as required by the census act. The jury also reported against one of the enumerators for neglect of duty in not completing his district in


CENSUS INFORMATION IS CONFIDENTIAL
...on your OATH
Census Employees!
YOU ... ARE RESPONSIBLE FOR KEEPING CENSUS INFORMATION CONFIDENTIAL
This is a conversation piece! –
–a CENSUS REPORT is not a conversation piece!

SOME POSTERS USED TO REMIND CENSUS EMPLOYEES OF CENSUS CONFIDENTIALITY

conformity with the act."[5] One of the most publicized cases in recent history was the *United States v. Rickenbacker* in 1962. The defendant contended that the content of the 1960 questionnaire was unreasonable and thus in violation of the Fourth Amendment, which protects against "unreasonable searches and seizures." The courts decided in favor of the Government and made the following statement: "The authority to gather reliable statistical data reasonably related to governmental purposes and functions is a necessity if modern government is to legislate intelligently and effectively."[6]

Resistance to the 1970 census in the form of willful nonresponse or destruction was minimal. This was so even though substantial legislative attack and publicity developed against the census in the late 1960's. Only five cases were brought to trial. One defendant, a State representative, was

FROM THE FRONT OF THE 1980 CENSUS QUESTIONNAIRE

"The law under which the census is taken protects the confidentiality of your answers. For the next 72 years – or until April 1, 2052 – only sworn census workers have access to the individual records, and no one else may see them."

Maintaining the confidentiality of census information collected under Title 13, U.S.C. (the Census law), is of major concern to the Census Bureau. The following questions and answers are designed to indicate the extent of the Census Bureau's efforts to protect the public – all persons and business organizations whose names appear on census questionnaires – from unauthorized disclosure.

Q: Does the name and/or address of anyone on a Census Bureau questionnaire go into any government computer, including those of the Census Bureau?

A: **No.**

Q: Are Social Security numbers requested on decennial census questionnaires?

A: **No.**

Q: How does the Bureau protect the personal information collected in the Decennial Census of Population and Housing?

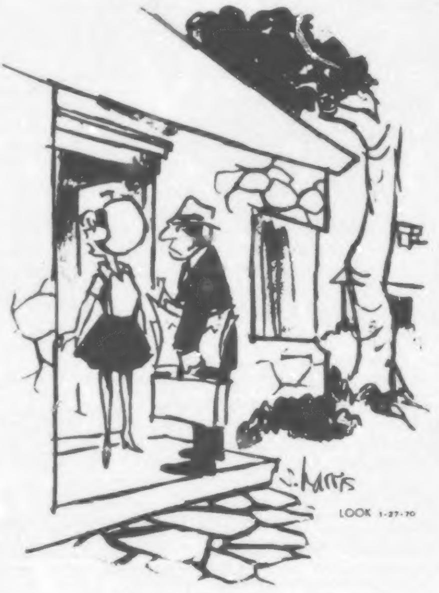
A: **The original census forms are put on microfilm which is kept under strict security in protected buildings. The information can be retrieved only by authorized persons. The original forms are maintained under tight security, with access only by sworn Bureau employees, until processing is complete, and then they are destroyed.**

Q: How long is census information kept confidential?

A: **For 72 years. At that time the microfilmed census records are turned over to the National Archives for permanent storage. People interested in researching their family background often use these old census records.**

Q: Do other Federal agencies or courts have the power to obtain confidential information about individuals from the Census Bureau for purposes of taxes, investigations, prosecution, etc?

A: **No. The census law on confidentiality prohibits the Census Bureau from releasing personal information collected under census law to other Federal agencies for such purposes.**



"Fred, do we want our census taken?"

© S. Harris. Reprinted by permission.

While the census is mandatory, The Census Bureau realizes that the willing cooperation of the public is critical.

found guilty, fined $100 (which was suspended), placed on 30 days' probation, and required to complete a census form. Four persons associated with an action group that had picketed census field offices in five cities were prosecuted. All were fined, although two had their convictions reversed due to legal technicalities.

Track Record

Today, the Census Bureau staff knows that individual information must be held in the strictest confidence.This has not always been required in the past. Until the mid-1920's, there were authorized releases of individual data that were then considered proper. Today they would cause a storm of protest in the press, in the courts, and in Congress. One release occurred in 1918, during World War I. Congress had passed a War Powers Act, and information about individuals was given to the Department of Justice. This was used as evidence in prosecuting young men who claimed they were too young to register for the draft. (Equally, the defendants could use transcripts to disprove Government charges.) In this manner, personal information for several hundred young men was released to courts, draft boards, and the Justice Department. In another case, the Bureau supplied

ATTACK ON THE '70 CENSUS

TV editorial:

Unless Congress blows the whistle soon on eager Census Bureaucrats . . . you'll have to tell all in 1970 or face a $100 fine or 60 days in jail. And there are more than 100 intimate questions in the $200 million census project, including with whom do you share your bathroom? If you agree that the census should be restored to its original purpose (counting people, not grilling them) let your...Congressman know about it now.

Newspaper editorial:

A great many citizens and a number of Congressmen are registering concern over the 120 questions the Census Bureau has cooked up to confront the populace with when the 1970 census is taken. We share their feeling that many of the questions will be an intrusion of the individual's privacy as well as entirely irrelevant to the basic purpose of the census (that of counting people). The bad feature is . . . answering all the questions will be compulsory.

Congressman:

I hold the view that the constitutional intent of the census (that of counting the people to determine congressional districting) is not being followed, particularly with the extensive mandatory questions now included on the census forms. Because many of the questions asked in a decennial census are of a very personal nature, I contend this violates the privacy of our citizens (and in most instances for no public purpose). I believe Congress should take an active role in determining what types of personal information will be sought from the American people.

Citizen:

It has been suggested by some that the United States Census Bureau should sponsor the television program "I Spy." It seems our government is becoming or proposes to become a supersnooper.

the names and addresses of a number of individuals who were reported as illiterate to several States that had requested the information. These releases were consistent with law, since the current tight restrictions in the law were not enacted until 1929. The Bureau stopped such releases during the late 1920's.

The Census Bureau was even able to resist intense political pressure for the release of data. For example, in 1941, with World War II underway, there was near hysteria about the fact that there were many Japanese-Americans living on the West Coast. This led to one of the most embarrassing moments in U.S. history—the confinement of large numbers of loyal Japanese-Americans. At the height of this feeling, the Secretary of War is believed to have requested the Census Bureau to supply the names, addresses, and ages of all persons of Japanese extraction living on the West

Coast. This time, in spite of the national emergency, the Bureau held to its position on confidentiality of individual records and refused to release the information. The Bureau did supply summary data for political jurisdictions, but no individual data were released. Again, in 1947, during an era of concern about possible Communist infiltration and sabotage, the Attorney General requested information from census records about certain individuals for use by the FBI. The request was denied.

Finally, a loophole in the law turned up in 1961. The courts required the St. Regis Paper Co. to deliver a file copy of a Census Bureau form to the Federal Trade Commission. As a result, Congress quickly amended the law to extend census confidentiality to include even copies of census questionnaires that are kept by businesses for their own files.

In summary, confidentiality was not at first the responsibility of the Census Bureau. But over time it grew to be an integral part of census taking in America. We turn next to examine how confidentiality is maintained as a modern census is taken and processed.

Modern Census Processing

Before the advent of modern processing techniques, the data on each form were manually keypunched onto cards. Today this laborious process is bypassed. The questionnaires are first microfilmed, then an optical sensing system (called FOSDIC) "reads" the microfilm and transfers the information onto computer tape. Of particular importance is the fact that the address of the household and the names of its members cannot be interpreted by FOSDIC. Thus, the only identifiers on the tape are geographic codes that match the questionnaire to the block or enumeration district where the household is located.

Even this is not enough to guarantee that a person could not be identified. Some areas have such small populations that it would be possible to infer whose characteristics are represented in the tables. The computer, therefore, is programmed to suppress any characteristics that would enable an analyst to identify individuals.

When the tabulation of a census is finished, the original paper questionnaires (which are stored in guarded buildings on a Government facility) are destroyed. The shredded remains are then shipped in sealed boxcars and recycled, with Bureau officials watching until they drop into the paper pulping vats That leaves only the microfilm. Where does it go after the data are processed? The rolls are sent to the Personal Census Service Branch in Pittsburg, Kans., commonly referred to as the Age Search Service. This is a unique, self-supporting operation that has helped millions of people who need to verify some item of information about themselves.

Most individuals request age information as recorded in an earlier census, to be used as substitutes for birth certificates that either never existed or have been lost or destroyed. People use their census records to qualify for retirement, for social security, for Medicare, to get a passport, and for many other uses.

This service, however, is provided only at the request of the actual respondent or his/her legal representative. For example, a son cannot ask about his father unless he has a power of attorney or a death certificate. Similarly, a considerable number of other requests must be turned down, even though many of them promise to confer benefits if the individual can be located. It is not proper, for example, to give any information that would help a lawyer locate a missing heir, since the missing person may not wish to be located. Finding information for those who request it is not an easy job. The data are filed by alphabetical name listings. For the correct reel of film to be located, the person making the request must supply very specific information about where he/she lived at the time of a given census. Thus, it takes an expert to utilize the microfilm effectively.

Records Of Past Censuses

Where is the microfilm of past censuses stored? The Pittsburg, Kans., facility has microfilm copies for the censuses of 1900 through 1960. In addition a copy of the 1960 and 1970 records are held under security conditions at Jeffersonville, Ind., so that if one copy was accidentally destroyed the whole census would not be lost. (Incidently, a tornado lifted one corner of the roof of the Pittsburg facility a few years ago.) The records of the counts from 1790 through 1950 are held in storage by the National Archives. Although the census of 1890 (mostly destroyed by fire) is almost nonexistent, records of the first 12 censuses (1790 to 1880) are accessible to the public, and the 1900 census is accessible to genealogists, historians, and other researchers.

The fact that the National Archives holds the early census records presents the Bureau with a problem. The law under which the Archives operates says that Government records shall be made public after 50 years, unless an interagency agreement stipulates a longer period of time. In 1952, the Director of the Census Bureau and the Archivist agreed that census records should remain closed for 72 years (an average person's lifetime). However, there was a difference in the status of protection between the census of 1900 and that of 1910. The 1910 count was preceded by a Presidential proclamation, a promise from President Taft, which stated: "There need be no fear that any disclosure will be made regarding any individual person or his affairs."

The question is how long does that promise and the law's guarantee of confidentiality apply? A lifetime? One hundred years? Or forever? At the moment, the answer remains 72 years. Since there has been no evidence that Archives' disclosures have caused harm to any individual, Congress has viewed the 72-year period of closure as a suitable balance between the Bureau's preference for confidentiality forever and the intrinsic value of eventual release of old census records for genealogical and other purposes. The Bureau is zealous in pursuing the policy of confidentiality not just for legal and moral reasons, but also because its data collection system ultimately depends on the goodwill and cooperation of people and companies. Should the public's confidence in the Bureau's pledge of confidentiality erode, goodwill and cooperation will erode. And if this occurs, the census will become less useful as a prime decisionmaking tool.

ACCURACY

A second and increasingly controversial issue in recent years is the accurate counting of population. The primary objective of the census is to produce an accurate count of the population. In fact, in an ideal census, the Bureau would count every resident of the United States as of April 1 of the census year. However, this is virtually an impossible task. It is unlikely that the census has ever counted everyone. For several decades the Bureau has recognized the fact that each census misses some people. While it is theoretically possible to produce a count that is too large (and it occasionally occurs in some areas or segments of the population), the more common result is a count that is lower than the actual total. The net effect is known as an undercount.

From the earliest days of the census, observers expected an incomplete count of population.

William S. Rossiter, a census employee, analyzed the reasons for the inaccuracy of the first census:

> One difficulty encountered by the enumerators in certain sections of the country was the unwillingness of the people to give the information required. Many persons had never before been enumerated. Some were superstitious regarding a census. An early colonial enumeration in New York had been followed by much sickness; and the people . . ascribed this sickness directly to the census. But a very much more potent factor in arousing opposition to the enumeration was the belief that the census was in some way connected with taxation.[7]

Finally, there is no doubt that George Washington expected an undercount for he even outlined what he felt were the reasons for it:

> . . .the real number will greatly exceed the official return, because from religious scruples, some would not give in their lists; from an apprehension that it was intended as the foundation of a tax, others concealed or diminished theirs; and from the indolence of the mass and want of activity in many of the deputy enumerators, numbers are omitted.[8]

Later censuses were by no means exempt from such difficulties. One committee of the American Statistical Association communicated to Congress its dissatisfaction with the 1840 census:

> . . .it would have been far better to have had no census at all, than such a one as has been published, and they respectfully request your honorable bodies to take such order thereon, and to adopt such measures for the correction of the same, or if the same cannot be corrected, of discarding and disowning the same, as the good of the country shall require, and as justice and humanity shall demand.[9]

The census of 1910 suffered from similar defects. In testimony before the Senate Committee on the Census in 1918, serious questions were raised with respect to the quality of the data produced by some enumerators. Referring to an exhaustive review of certain returns in St. Marys County, Maryland, it was determined that more than 500 names could not be accounted for. One of the enumerators apparently "made up 198 additional names, partly from people who had moved away, partly from summer boarders and nurse girls at hotels, and partly from imagination, filling up the ages and occupations at will." Some examples:

> Eccleston S. Graves appeared as a school teacher, 6 years old. Thomas J. Graves, 2 years old, was described as a farm laborer employed during the entire year, who could read, write, and speak English. Joshua Niles, 2 years old, was said to be a carpenter.[10]

The "want of activity in many of the deputy enumerators," as President Washington put it, does not appear to be a significant factor in the undercount of modern censuses. Prospective census employees, even temporary ones, are screened, and those selected are trained and closely supervised. Moreover, Bureau professionals use a wide range of checks, including random recanvassing of areas covered by census collectors, to ensure that individuals are not missed.

It is, in part, for these reasons that recent censuses have improved steadily in their coverage of the population. The Bureau's estimates suggest that the 1970 census was the most accurate ever, with a net underenumeration of only 2.5 percent or 5.3 million people. This figure was less than the 2.7 percent undercount in 1960 and the 3.3. percent in 1950.

The results also showed that the undercount figure is not uniform either among regions of the country or among groups within the country. It is higher: (1) in the South than in the North; (2) for men ~~than~~ for women; (3) for Blacks than for Whites, and (4) for the poor than the affluent. In addition, although data are not available for making numerical estimates, there is little doubt that the undercount of Hispanics is also substantially higher than that of non-Hispanics.

Factors Involved in the Undercount

The Bureau has tentatively identified several factors that appear to be central to the undercount: Suspicion, fear, carelessness, mobility, and apathy. There are some people who are suspicious that the information they give to the Bureau of the Census will somehow be used against them and hence they deliberately withhold information. For example, families with children who live in dwellings where children are not permitted might fail to report them. Individuals who have entered the country illegally might fear detection and deportation and avoid being counted altogether. Others live in condemned houses and fear eviction or prosecution for trespassing if discovered. Still others have living arrangements that, if discovered, could result in the curtailment of their welfare or social security allowances. There are even those who believe the government wants to identify certain segments of the population to plan programs that would exclude them In other cases, entire housing units are missed because enumerators don't find them (e.g., people *do* live in chicken coops, sub-basements, tents, automobiles, and recreation vehicles).

Our society is highly mobile. Millions of people are on the move every year. Some relocate for health or retirement reasons, others in search of job opportunities. Still others are transferred by their companies to jobs in other areas. Some move because their homes are destroyed; some move because they want to experience a different climate or style of life. Many of these people will be in transit while the census is being taken, and may not want to be bothered in the midst of the natural confusion surrounding a move.

Finally, some people just aren't interested. Many don't realize how important a census is to them personally. They are simply not aware that census figures have an impact on American society: The data are needed to make decisions regarding the building of schools, the location of emergency and health services, the marketing of products, as well as for equal representation in Congress and fair distribution of Federal funds.

Coverage Improvement Plans

In an effort to reduce the undercount in 1980 the Census Bureau has planned several programs. Some programs have been tried previously with moderate success, while others are new. The programs tried previously and scheduled to be repeated in 1980 are listed below.

1. *Question A* (1980 Questionnaire): This is essentially a review and followup procedure. Respondents are asked to report the number of living quarters in their building. This response will be checked against the Bureau's list of addresses to see if all units were accounted for. When the numbers reported disagree with the Bureau's listings, a followup is made to see if additional people may be found and counted.

2. *Precanvass Operations*: The Bureau has purchased commercial mailing lists and they have been checked by the Postal Service for completeness. The Postal Service will add any addresses that should be on the lists and are omitted. Just before taking the census, the Bureau will verify the addresses in difficult-to-enumerate areas by having enumerators check them against the buildings themselves.

3. *Movers Check*: The Bureau of the Census will obtain change-of-address cards from post offices and check them against census records. This procedure should help identify persons who moved during the census and were missed at both their old and new addresses.

4. *National Vacancy Check*: The Bureau will recheck housing units classified as vacant to determine their actual status at the time of the census. This procedure should substantially reduce the likelihood of missing people because of error in the classification of their housing units as vacant or empty.

5. *Supplemental Forms Operation*: Supplemental forms will be placed in strategic places for use by persons who were not at their usual place of residence on census day. The Bureau will then review these forms to identify the persons, among those who were staying at hotels, lodges or camps, etc. or who were traveling during the census, and did not report a usual home elsewhere.

New coverage improvement programs scheduled for implementation in 1980 include:

1. *Team Enumeration*: Residents of certain locations are openly hostile toward government representatives and other "outsiders." In the past, some enumerators, fearing for their safety, were reluctant to canvass such areas. As a safety measure in 1980, the Bureau plans to use teams of two or more enumerators to canvass known trouble spots. In such cases, a team will usually work in the same building or on the same street at the same time, but will not necessarily work together.

2. *Spanish Questionnaire*: Some persons may have neglected to return the 1970 questionnaires because they could not read English. In other cases, the

success of the interview may have been affected by similar language barriers. In 1980, the Bureau will use both a Spanish language questionnaire and bilingual interviewers where needed. Each standard questionnaire contains a message in Spanish that explains how a Spanish language questionnaire can be obtained.

3. *Review by Local Officials*: In addition to having the Postal Service check mailing lists, the Bureau will also have preliminary counts of addresses and population by geographic area reviewed by local officials. This will be conducted in two stages. First, local officials will review Bureau-supplied housing unit counts before the census is taken, based on the master address list prepared in advance. At this time they may indicate additions or deletions. Then, after the census is taken but before census district offices are closed, local officials will review the preliminary population and housing counts for blocks and other areas. Local officials will *not* have access to confidential census returns or even to the original address list used in taking the census. Preliminary counts are rough counts that do not include some people who are away from home on census day or certain others added to the count in subsequent coverage improvement operations. Local officials can at this time challenge counts. Since district offices will still be open at this point, investigations of challenges can be conducted relatively easily where significant count differences are identified.

4. *Expansion of Mail-Out/Mail-Back Technique*: In collecting a census by mail the first step is the preparation of a master address list which can subsequently be checked by postal and census officials for completeness. Thus the complete coverage of all housing units does not depend solely on the ability of an enumerator to locate all housing units within a prescribed area and to contact everyone at home during the few short weeks in which enumeration activities are concentrated. It has also been shown that some people are more willing to complete the census form in private than to provide the information directly to an enumerator (who is frequently a neighbor). Mail-out/mail-back procedures were used to cover 60 percent of the population in 1970. The program is being expanded to cover over 90 percent of the population in 1980, everywhere except in sparsely settled areas. In 1970 the Bureau of the Census had an 88 percent response rate for the short-form questionnaire in the mail-out/mail-back technique.

5. *Minority Statistics Program*: The need for this program arises out of the fact that the quality of decennial statistics in 1960 and 1970 was noticeably poorer for the black population than for the population as a whole. For example, the undercount was 9.9 percent for black males and 5.5 percent for black females in comparison to 2.5 percent overall. Although Census Bureau officials do not have complete supporting evidence, they believe that the population of Spanish origin, and possibly other racial or ethnic minorities were undercounted in a manner substantially exceeding that for

the general population. The objectives of the Minority Statistics Program are, therefore: to inform members of all minority populations concerning the usefulness, to them, of statistics provided by the Bureau; to assist them in the use of such statistics; and to obtain their recommendations and support toward improving coverage and quality of data for the 1980 census.

Accuracy—especially the reduction of the 1980 undercount—has become a heated political issue. This can be better understood in terms of the uses of census data in appropriating funds. Currently, more than $50 billion of Federal tax money are distributed annually by the Federal Government using population data as part of the allocation formulas. Many States make additional disbursements to localities based on census data.

ESTIMATING THE UNDERCOUNT

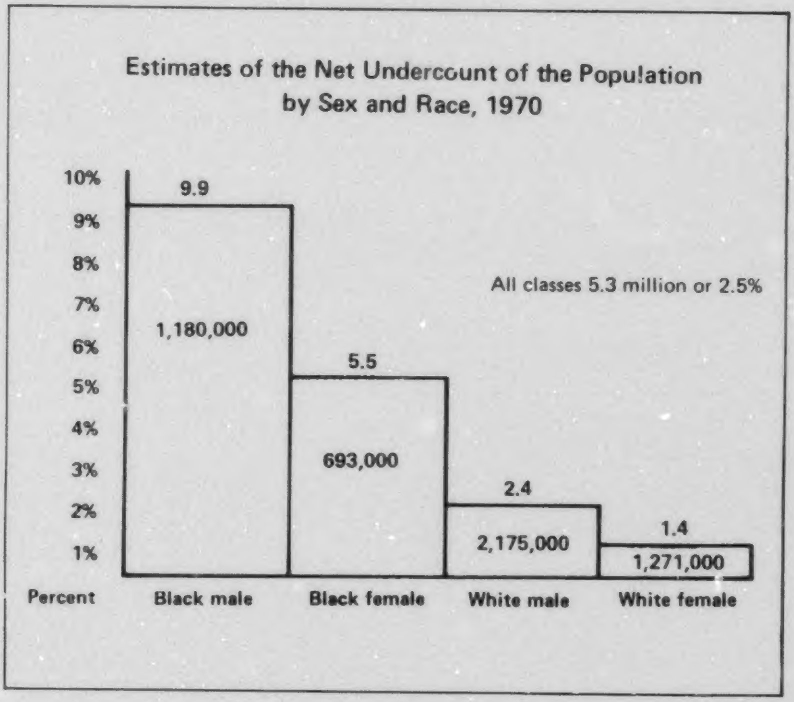
The same methods the Bureau of the Census uses to evaluate the completeness of its count also enable the agency to estimate the so-called undercount figure. The process is at the same time both complex and simple.

Simply stated, the Bureau of the Census estimates a true population (on the national level) and subtracts from it the actual number of persons counted in the census. The difference is the estimated undercount. The complexity of the procedure lies in the manner by which the Bureau of the Census derives its estimate of the true population. To do this, the Bureau uses a complex mix of prior census statistics, birth and death records, immigration data, and medicare enrollment figures.

For persons born after 1935, (ages 0 through 34 in 1970 and ages 0 through 44 in 1980), birth and death records, together with net immigration figures—the number of persons who immigrate (move into this country), minus the number of people who emigrate (move out of this country)—were used to estimate the "true population." 1935 was the first year that birth and death records were complete enough to be used to estimate population. Before that, such records were a combination of filing with various Bureaus of Vital Statistics, family bibles, family folklore, or the memories of family members interested enough to remember. Of course, only those records filed with a Bureau of Vital Statistics were reliable enough for the purposes of a factfinding agency. The Bureau of the Census expects that birth and death records since 1935 will be even more complete for the 1980 census. By that time, the age group 0 through 44 will comprise roughly 70 percent of the total population.

POPULATION DATA AND FEDERAL FUNDING FORMULAS

In recent years, there has been much controversy surrounding the use of population data as a factor in allocation formulas. The controversy has focused on the timeliness and accuracy of the population data used and on



Estimates of the Net Undercount of the Population by Sex and Race, 1970

the appropriateness of population as an allocation factor. Currently, the amount of Federal funds available to a specific area depends, at least partially, on the size of its population.[11]

Why is population data used as a factor in allocating Federal funds? Most Federal programs that allocate funds to local areas do so, at least partially, on the basis of total population or some segment of the population. For example, under comprehensive planning grants for law enforcement assistance, each State is allotted $250,000 plus a portion of any remaining grant funds based on its share of the total population. For child abuse and neglect programs, each State is apportioned funds based on its share of the total number of children aged 18 and under. Career education incentive grants, which provide funds for the purpose of relating education to work and work values, allocate funds on the basis of the number of 5- to 17-year olds in each State. Population, which is used as a measure of need in these programs, gained wide acceptance partly because equal shares per person suggest what is commonly referred to as "political fair share," and partly because population data are readily available and easily obtainable at regular intervals.

The use of population as a measure of "political fair share" can be traced back to the earliest grants that were often allocated on the basis of congressional representation. Congressional representation roughly corresponds to total population, with some overrepresentation for the less populated States. Further acceptance of population as a "standard of equity" is also reflected in the fact that most State-by-State distributions of grants are analyzed in per capita terms.

The Problems and Limits of Population Data

Though total population is a frequently used component in allocation formulas, there are several disadvantages associated with its use. The first of these deals with whether population is an adequate measure of need for the service or activity receiving Federal aid. The second deals with the accuracy of the data used, and the third deals with the timeliness of population data from a decennial census.

The question of whether the total number of people accurately reflects the need for a service or activity was raised in a recent study by the Advisory Commission on Intergovernmental Relations. The Commission found that for many of the programs where population is used as an allocation factor, there exists little relationship between population size and the need for a program. For instance, the Commission questioned whether total population is the appropriate measure of need for the law enforcement assistance program since crime rates vary considerably among State and local jurisdictions.

Segments of the population, such as the number of aged or the number of school-age children, can provide better measures of need. For example, under the nutrition program for the elderly, funds are distributed on the basis of the number of persons aged 60 and over. However, in many instances, these segments of the population provide only a rough indicator of need. A portion of the funds, for instance, under the child welfare services program, is distributed on the basis of the number of children in each State under the age of 21 and not, for example, the number of homeless, neglected, and dependent children, which is one of the main targets of the program, but a group for which precise statistics are not readily available.

To have an adequate measure of the need for a Federally assisted program, there must be a clear understanding of the program's objective. For instance, if the purpose of a program is to reduce youth unemployment, then the youth unemployment rate would be considered to be an appropriate measure of need. Often, though, the need for a program is difficult to document. A program, for example, to reduce teenage alcoholism may have

POPULATION ESTIMATES

In order to meet the need for basic population figures more fully, a wide variety of estimating techniques, including the use of sample surveys, has been developed. Estimates viewed broadly can be divided into several types on the basis of their time reference and basis of derivation. These types, which achieve different levels of reliability, are: (1) Intercensal estimates, which relate to a date intermediate to two censuses and take the results of these censuses into account; (2) postcensal estimates, that relate to a past or current date following a census and take that census and possibly earlier censuses into account, but not later censuses; and, (3) projections, that relate to dates following the last census, usually future dates, for which no current reports are available.

The official population estimates for the United States prepared by the Bureau of the Census relate to the population on the basis of usual residence rather than the de facto (actually present) population, just as the census counts do.[12]

a clear objective, but then the teenage alcoholism rate would have to be defined and measured accurately.

The second problem with using population as a factor in allocation formulas involves the accuracy of the data used. Errors occur in both censuses and estimates. A significant type of error in a census is undercounting, that is, the failure to identify and include all individuals. Errors in estimates may also include errors in the estimates of postcensal changes resulting from errors in the data, methods, and assumptions employed. Generally, errors in estimates are greater than errors in a census.

A third problem in using population as a factor in allocation formulas concerns the timeliness of the data used. Though a complete population and housing census is taken every 10 years, the data soon become outdated. Furthermore, there is up to a 2-year lag from the time a census is taken until the bulk of the data are available. This means that, for many programs, the 1970 census of population will be in use until late 1982. The result is that rapidly growing States and localities are not getting their fair share of funds because some allocation formulas use 1970 census data rather than current population estimates.

In July 1975, the Office of Management and Budget revised the circular, Standard Data Source of Total Population Used in Distributing Benefits, to require the use of the most current data in making distributions of Federal money based on total population.

Further steps have been taken to ensure that more timely and accurate data will be available. On October 17, 1976, the mid-decade census bill was signed into law. The law requires the use of the most recent population data in Federal assistance programs unless the law authorizing the program specifies that decennial census data be used. The law also requires that annual population estimates be made for areas with more than 50,000 people and that biennial estimates be made for smaller areas.

Distributional Aspects

How does the use of population data as a factor in allocation formulas affect per capita grant receipts? If $1 billion were to be distributed to the 50 States and the District of Columbia on the basis of 1975 population estimates, each State would be entitled to the same amount of funds per person, which would be approximately $4.70 per person. The smallest State, Alaska, would receive a total of $1.7 million and the largest State, California, would receive $99.4 million, as indicated in column (A) of table 3-1.

Very few programs, though, are designed in this manner. Only two of the 45 programs that use total population as an allocation factor—social services and assistance to States for State equalization plans—distribute funds solely on that basis. Six programs that use service population, that is, the number of school-age children (education innovation and support, libraries and learning resources, grants to strengthen guidance and counseling services, civil defense, State and local maintenance services, and establishment and expansion of community colleges,) distribute funds solely on that basis.

The remaining programs include either minimum or maximum dollar amounts a State or other jurisdiction can receive or other grant allocation factors such as per capita income, public road mileage, or average Statewide per pupil expenditure. These factors restrict the impact of population size on per capita grant receipts. For example, the Federal Government may distribute $1 billion among the States on the basis of population, but with the added stipulation that no State will receive less than one-half of one percent of the amount available (a minimum of $5 million). With this restriction added to the distribution formula (see column (B) of table 3-1), per capita grant receipts would range from $4.60 in the larger States to $14.20 in Alaska. California would be entitled to the most funds, $97 million; and 13 States—Alaska, Delaware, Hawaii, Idaho, Maine, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, Vermont, and Wyoming – and the District of Columbia would be entitled to the minimum allotment of $5 million. The greater the weight of allocation factors in the formula that is not related to population, the greater will be the range in the per capita grant receipts.

The allotments under the two distribution formulas would indicate the amount of Federal funds to which a State may be entitled, but not the actual

Table 3-1. Dollar Share Distribution, by States, Using Alternative Federal Allocation Formulas

Distribution of $1 Billion[1]
(amount in thousands)

State	(A) Equal per capita share ($4.70)	(B) Minimum allotment ($5 million)		(C) Actual per capita Federal aid[1]
		Amount[2]	Per Capita	
Alabama	$16,957	$16,618	$ 4.60	$227
Alaska	1,652	5,000	14.20	779
Arizona	10,435	10,226	4.60	214
Arkansas	9,928	9,729	4.60	246
California	99,403	97,415	4.60	237
Colorado	11,890	11,652	4.60	228
Connecticut	14,516	14,226	4.60	219
Delaware	2,717	5,000	8.64	209
District of Columbia	3,360	5,000	6.98	941
Florida	39,212	38,428	4.60	162
Georgia	23,113	22,650	4.60	243
Hawaii	4,059	5,000	5.78	307
Idaho	3,848	5,000	6.10	255
Illinois	52,293	51,247	4.60	200
Indiana	24,920	24,421	4.60	151
Iowa	13,466	13,197	4.60	194
Kansas	10,637	10,424	4.60	198
Kentucky	15,934	15,615	4.60	251
Louisiana	17,788	17,432	4.60	234
Maine	4,968	5,000	4.69	260
Maryland	19,229	18,843	4.60	248
Massachusetts	27,346	26,799	4.60	251
Michigan	42,966	42,106	4.60	232
Minnesota	18,421	18,052	4.60	230
Mississippi	11,007	10,788	4.60	252
Missouri	22,348	21,901	4.60	190
Montana	3,510	5,000	6.68	300
Nebraska	7,254	7,108	4.60	219
Nevada	2,778	5,000	8.45	252
New Hampshire	3,838	5,000	6.11	211
New Jersey	34,327	33,640	4.60	203
New Mexico	5,382	5,274	4.60	333
New York	85,021	83,321	4.60	314
North Carolina	25,577	25,065	4.60	197
North Dakota	2,979	5,000	7.87	268
Ohio	50,482	49,472	4.60	186
Oklahoma	12,725	12,470	4.60	244
Oregon	10,736	10,521	4.60	246
Pennsylvania	55,493	54,383	4.60	227
Rhode Island	4,350	5,000	5.39	265
South Carolina	13,222	12,958	4.60	210
South Dakota	3,204	5,000	7.32	310
Tennessee	19,651	19,258	4.60	214
Texas	57,417	56,269	4.60	185
Utah	5,659	5,546	4.60	243
Vermont	2,210	5,000	10.62	326
Virginia	23,305	22,831	4.60	213
Washington	16,629	16,296	4.60	227
West Virginia	8,460	8,290	4.60	299
Wisconsin	21,617	21,185	4.60	232
Wyoming	1,755	5,000	13.37	269

[1] Based on 1975 population estimates.

[2] Amounts only approximations.

Source: Compiled from Tables 1, 2, and 3 in Library of Congress, Congressional Research Service Report "Federal Formula Grant In-Aid Programs that Use Population as a Factor in Allocating Funds," 1975.

[illegible] provided. The allotments or apportionments indicate the total available to the State or recipient jurisdiction if certain requirements, regulations, or other criteria established under the program are met. Such requirements or regulations may take the form of (1) a requirement for a specific State plan for the program, (2) maintenance of effort comparable to a previous time period, (3) provisions that the recipient provide a share of the total cost of the program or project, (4) coordination among the programs, (5) approval of projects to be conducted under the program, and (6) conformance with various civil rights laws.

In practice, as shown in column (C) of table 3-1, population size appears to have had little effect on the actual allocation of Federal aid. Aside from the District of Columbia and Alaska, which had unusually high amounts of per capita Federal aid, in fiscal year 1975 per capita grants ranged from a low of $151 to a high of $335. Per capita grants were lowest in Indiana, 34 percent below the national average and highest in New Mexico, 47 percent above the national average. The average for the United States for fiscal year 1975 was $228 per person.

In their study of the Federal grant-in-aid system, the Advisory Commission on Intergovernmental Relations found that population, urbanization, and per capita income—the three most commonly used formula allocation factors—explain only one-fifth to one-third of the interstate variation in Federal grant receipts. According to the study, the great majority of differences in per capita grant receipts are not related to these measures but reflect numerous influences [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

At least 107 programs use total population or some segment of the population as a factor in allocating Federal funds. Forty-two of the programs use total population, 62 of the programs use some segment of the population such as the number of school-age children, and three of the programs use both total population and a segment of the population. These general programs include:

Agriculture Research and Service

Community Development

Conservation and Land Management

Elementary, Secondary, and Vocational Education

Employment and Training

Energy

General Education Aids

General Government

General Purpose Fiscal Assistance (including General Revenue Sharing)

Health

Law Enforcement Assistance

National Defense

Pollution Control and Abatement

Recreation Resources

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] In January of 1979, the Director of the Census Bureau, Vincent P. Barabba, made the following statement before a group of State leaders: "Sir Francis Bacon said that knowledge is power. He should have also mentioned that knowledge is expensive." During recent months, considerable public attention has been focused on the 1980 census and its cost. The following headlines have appeared: "Quality of Census Won't Match Cost" (*Kansas City Times*, Kansas City, Mo., December 22, 1978); "What Price for Census?" (*Springfield News*, Springfield, Mass.

[illegible] (Oakland Press, Pontiac, Mich., June 24, 1979); "Next Census Will Cost Four Times More Than Last One," (Miami Herald, Miami, Fla., January 11, 1978). This section introduces the reader to the cost issues these newspapers raise while describing the major components of the 1980 census budget. The cost data included below are intended to provide an overview of Census Bureau activity. Unit costs are, of course, complex given the scale of Census operations and should be understood as approximations rather than hard facts.

For the 1970 census, from initial planning to dissemination of the results, the cost was approximately $222 million, or just over $1 per person for the approximately 204 million persons who were enumerated. For the 1980 census the cost is currently estimated at $960 million, or more than $4 per person for the 222 million people that are expected to be enumerated. The $3 per capita increase between 1970 and 1980 comes from several sources and may be thought of in the following terms. The first dollar derives from inflation. Almost everything costs more today than it did in 1970—salaries, computers, paper, etc. It should be no surprise that the costs involved in the census would also increase. The next 75 cents derives from the direct efforts to improve coverage. An additional 50 cents comes from improvements in field administration, most of which are related to the efforts to improve accuracy. New data needs add 25 cents, and a further 25-cent increase is attributable to changes in the geographic and processing operations.

The last 25-cent increase derives from the gain in the number of households since the [illegible]. This increase is, in part, due to the large [illegible] [illegible] [illegible] United States [illegible] an increase of more than [illegible] percent. Thus, the growth in the number of [illegible] has been almost three times as rapid as that of population. This increase in households means added costs for the Census Bureau. It costs appreciably more to enumerate six people living in three households of two persons each than it does the same six people living in two households of three persons each.

The enormous costs involved in a census are revealed in the following pie chart (fig. 3-1) of the expenditures for the 1980 decennial census.

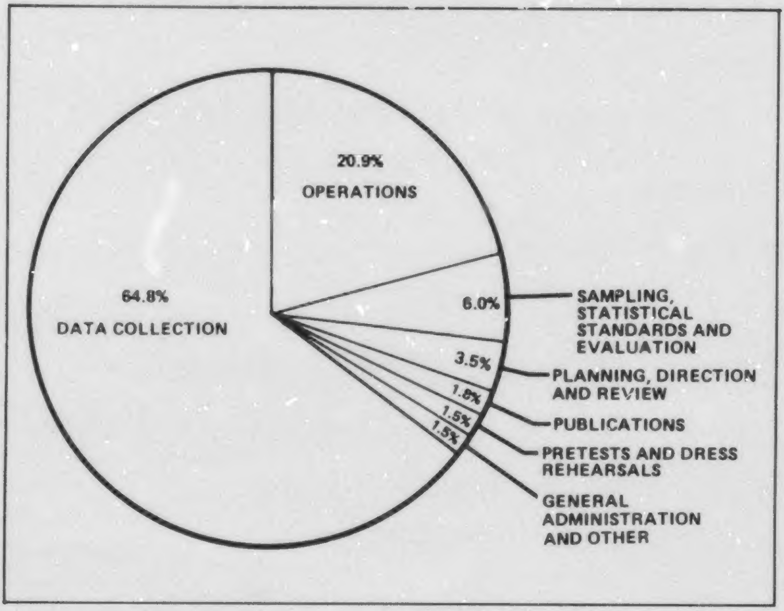


Figure 3-1. EXPENDITURES: THE 1980 DECENNIAL CENSUS

The largest single category of expense in the census is data collection, which claims almost two-thirds of the total budget. This category includes many different activities that take place before, during, and after census day itself. In addition to the actual field operation, it incorporates: (1) the cost of printing more than 86 million questionnaires; (2) the cost of preparing and verifying the address registers that are required for a mail-out/mail-back procedure; and (3) the cost of administering the national publicity campaign relating to the enumeration.

The second largest category is that of processing operations, which includes almost 21 percent of the budget. It is in this category that the geographic work and the enormous processing and computer costs occur. This process includes steps from the microfilming of the original questionnaires to the computer tabulations.

Next comes the category of sampling, statistical standards, and evaluation with 6.0 percent of the budget. It includes many of the activities that the Bureau undertakes in an effort to preserve the high quality of the U.S. census: The design of the sampling procedures, quality control, the various experimental programs, and a postenumeration survey to determine the undercount at subnational levels.

The remaining categories make up less than 10 percent of the total budget, but they too are important. If we combine the pretests and "dress rehearsals" with the category of general planning, direction, and review, it is clear that about 5 percent of the budget is expended on the design, testing, and coordination of the whole process. It is interesting to note that 1.8 percent of the budget goes to the publication of census results. This includes more than 250,000 pages of reports, plus numerous other kinds of data products (e.g. microfiche and computer tapes)

Another perspective on the decennial census is provided by the information in table 3-2. This table shows how the total costs of the 1980 decennial census are spread over the 9-year period involved.

The uneven pattern of expenditures is even clearer in fig. 3-2. This graph shows a remarkable similarity to the graph of total employment presented in the previous chapter, with the high peak during the actual census year.

The Cost of Printing and Mailing the Census

Do you know what it costs just to print and mail the census materials to every household in America?

To distribute one questionnaire to 86 million households (either a short or long form) requires the printing of several million extra copies, with a printing cost of about $21 million

To mail the questionnaires out to the people, they must be assembled into packets: envelope, questionnaire, instruction sheet, return envelope. The cost for assembly and labeling is $4 million.*

The postage to send them out to the 86 million households at bulk rate costs $6.6 million, or about 8 cents each.

First-class postage for the people to send them back to the government (assuming 65 million households return them)**will cost $8.3 million, or an average cost of about 13 cents apiece. Of course, the long forms cost more to produce and mail than the short forms.

This comes to a total cost of approximately $40 million.

*This includes everything assembled (envelopes, etc.) and millions of questionnaires that will be hand-carried by the enumerators.

**Of the 86 million households, 4.4 million are in areas covered by "conventional," procedures, in which the enumerator picks up the questionnaire.

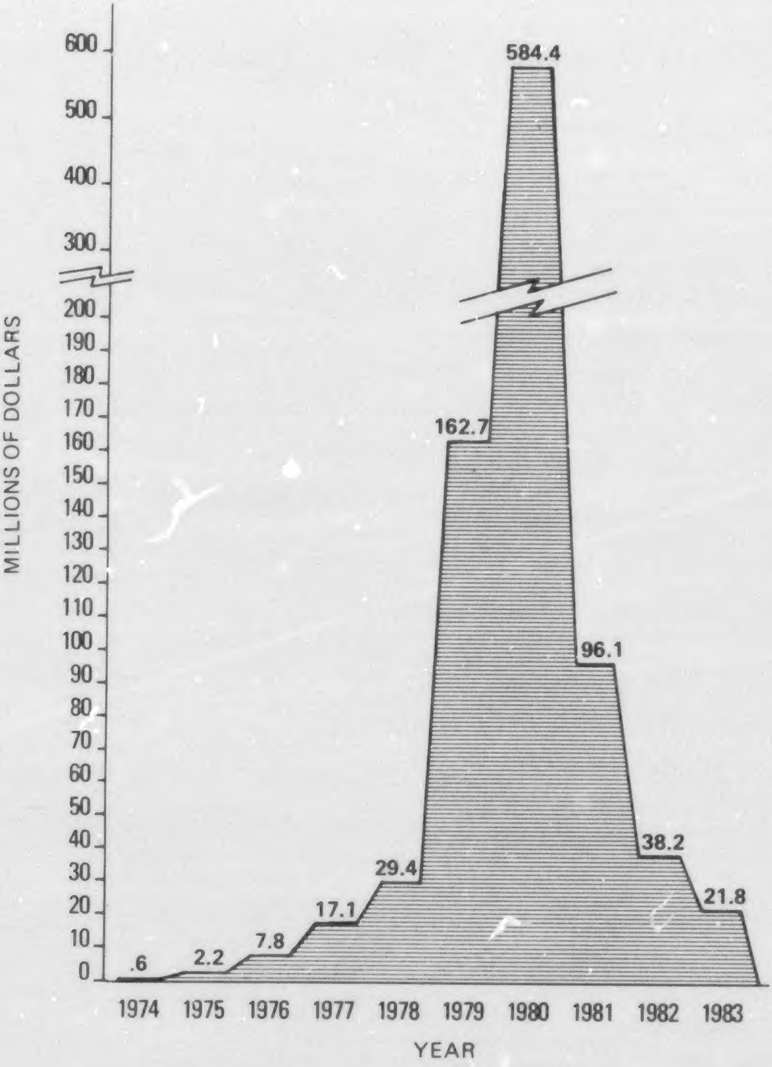


Figure 3-2. COST OF THE 1980 CENSUS, BY YEAR

Table 3-2. Cost of the 1980 Census, By Category and Time Period

(Amount in thousands. Time period refers to fiscal year)

	1974-1978		1979		1980		1981-1983		Total	
Category	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Total	57,069	5.9	162,679	17.1	584,350	60.8	155,988	16.2	960,086	100.0
Planning, Direction and Review	8,053	0.8	5,294	0.6	5,986	0.6	14,377	1.5	33,710	3.5
Pretests and Dress Rehearsals	12,912	1.3	1,937	0.2	—	—	—	—	14,849	1.5
Data Collection	4,452	0.5	115,998	12.1	488,798	50.9	12,360	1.3	621,608	64.9
Operations	25,994	2.7	31,250	3.3	61,939	6.4	81,725	8.5	200,908	20.9
Sampling, Statistical Standards, and Evaluation	2,933	0.3	3,725	0.4	22,790	2.4	28,076	2.9	57,524	6.0
Publications	—	—	—	—	1,222	0.1	15,537	1.6	16,759	1.7
General Administration and Other	2,725	0.3	4,475	0.5	3,615	0.4	3,913	0.4	14,728	1.5

— Represents Zero

SUMMARY

Public concern about the 1980 Decennial Census of Population and Housing is increasing, with particular emphasis on issues of privacy, accuracy, use, and cost. This concern is based on the fact that the census is relied on more heavily than ever for matters in which a complete count is expected. At the same time, improved statistical techniques permit the Census Bureau to estimate incompleteness with greater accuracy than in the past. Thus, concern about the census springs, ironically, on the one hand, from the highly professional work of the Census Bureau and, on the other hand, from the extraordinary confidence in the Census Bureau that is implicit in the way Congress mandates the distribution of large amounts of Federal funds. Concern about these issues has led to a number of legislative proposals in the Congress as well as a great deal of public debate. The Census Bureau has addressed these issues and incorporated numerous procedural and policy improvements in its plans for 1980 and beyond.

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PART II

CONCEPTS AND DEFINITIONS

INTRODUCTION

As factfinder for the Nation, the Census Bureau must collect, tabulate, and publish statistical information to meet a variety of data user needs. The foremost requirement facing the Bureau is its obligation to provide the most complete and accurate population count possible for the apportionment of congressional seats in the House of Representatives. Beyond the apportionment of political representation, however, there are numerous applications of census data. Many of these applications were discussed in Part I: The tying of Federal and State legislation and laws to census data for the distribution of public funds; the charting of social and economic trends; and the administration of public and private programs. Today, it would be quite difficult, if not impossible, for the Census Bureau to properly serve these disparate societal data needs unless the Bureau employed standardized and precise language, concepts, and methodologies in its census and survey operations. Part II, organized around the theme of census concepts and definitions should help the data user to understand three major operational subjects as they relate to the 1980 decennial census: Census geography, statistical methods, and demography.

Geography plays a crucial role in taking censuses and publishing the results for States, counties, cities, and smaller areas. The applied geographic work for a census basically consists of determining political and statistical boundaries, preparing the appropriate maps, and providing the technology for assigning the data collected on each census questionnaire to their proper geographic areas. This work has resulted in a number of tools and products that are helpful to the data user as well as to the Census Bureau, such as new types of maps, computerized geographic coding, graphic display systems, and ways of relating local data to census statistics for a variety of planning and administrative purposes. The Census Bureau tabulates data for over 40 types of geographic areas in its many censuses and sample surveys. Chapters 4 and 5 present the major geographic areas used in the decennial census and describe the general principles underlying their selection and use. For example, while the identification of legal geographic entities is essential to the proper collection and tabulation of census data (chapter 4), the political boundaries do not always accurately define the spatial patterns of economic and population phenomena. Thus, they are often inadequate for delineating the most meaningful areas for portraying and analyzing these phenomena (chapter 5).

A tremendous volume of data will be available for research and other purposes, in both published and unpublished formats, after the 1980 decennial census. Thus, many data users will require guidance to ensure that they properly describe their topic or that the statistics they use are most applicable to the defined question or problem. Mistakes are frequently made by data users who think they know what a particular census variable means but have not checked the concept definition in the appendices to the published reports. (After 1980, the best general reference source will be the *1980 Census Users' Guide*. Common user mistakes include using family income for household income, misinterpreting the term unemployed, or failing to determine what kinds of buildings are considered as housing units. All of these problems could be avoided by frequent and conscientious reference to concept definitions when interpreting data.[1]

Additionally, the comprehensive decennial census data collection and tabulation process itself creates important data use limitations and considerations since human and mechanical errors occur in any mass statistical operation. Therefore, the data user must be aware of (1) how data collection and tabulation procedures affect the resulting information; (2) the types of descriptive statistics used by the Census Bureau; (3) the kinds of sampling and nonsampling errors that are involved in census data; and (4) the caveats and limitations appropriate to any given data set. These topics are addressed in chapter 6.

The purpose of many studies using census data is to understand some aspect of the Nation's population. Part II concludes with an introduction to the study of demography, the scientific study of human populations (their size, distribution, and composition) and the changes that occur in these phenomena through the processes of fertility (births), mortality (deaths), and migration. Chapter 7 provides an overview of the U.S. population in terms of these components. Changes in population size, distribution, and composition continue to influence the planning and preparations for the 1980 decennial census as we shall see in Part III.

Reference

1. U.S. Department of Commerce, Bureau of the Census, *Reference Manual on Population and Housing Statistics from the Census Bureau*, Washington, D.C., March 1977.

Chapter 4
GOVERNMENTAL AREAS AND THEIR BOUNDARIES

MAJOR GEOGRAPHIC UNITS

The United States census has had a dual purpose since the early 1800's: (1) To provide an accurate basis for apportionment of political power and (2) to collect facts about the evolving society so as, in James Madison's phrase, "to make a proper provision for the agricultural, commercial, and manufacturing interest." The challenge to the Constitutional Convention delegates of 1787 and the new government was straightforward. How should the Nation's geographic area be divided, or apportioned, if at all, for determining political representation? The relatively simple answer to this question inaugurated the development, over two centuries, of precise census geography concepts and methods. Today, the selection and use of census geography plays an increasingly important role in the census process. For 1980, population and housing data must be collected, tabulated, published, analyzed, and explained for governmental units (e.g., States, counties) as well as for many functional or regional areas (e.g., metropolitan areas) to meet the dual data needs of our society.

The value of census data then, for most purposes, is directly related to the ability of the Census Bureau to classify data geographically.

The 1980 census will provide data for more geographic areas than any other census. These areas are classified as being either governmental or statistical areas. Many geographic areas are familiar (States, counties, and cities) and are classified as governmental units. This chapter will examine several aspects of census governmental units. Census data are also provided for geographic areas defined for statistical purposes: Standard Metropolitan Statistical Areas (SMSA's), urbanized areas, census tracts, block groups and blocks (statistical areas are defined in chapter 5). There are also census administrative units (e.g., enumeration districts) that fit within political boundaries and are adapted for statistical purposes as well (see fig. 4-1).

Geographic Areas

Census data are presented for various political and statistical areas.

Political areas include:

United States

States (and outlying areas)

Congressional districts

Counties

Minor civil divisions: Legal subdivisions of counties, called townships in most States

Incorporated places: Cities, villages, etc.

Statistical areas include:

Census regions and divisions: The 50 States have been divided into four regions, each containing two or three divisions.

Standard metropolitan statistical areas (SMSA's): Usually consist of a central city with a population exceeding 50,000, the county(ies) in which it is located and other contiguous counties that are metropolitan in character and are socially and economically integrated with the central city.

Urbanized areas: As defined by population density, each includes a central city and the surrounding closely settled urban fringe (suburbs) which together have a population of 50,000 or more.

Urban/rural: All persons living in urbanized areas and in places of 2,500 or more constitute the "urban" population, all others constitute the "rural" population.

Census county divisions: Statistical subdivisions of a county defined for those States where minor civil divisions are not appropriate for the publication of statistics.

Census designated places: Residential concentrations related to a geographically defined "place," although the "place" is not legally incorporated.

Census tracts: Statistical subdivisions of an SMSA with an average population of 4,000.

Enumeration districts: Census collection areas used as tabulation areas where block statistics are not collected.

Block groups: Census tabulation areas intermediate between census tracts and blocks.

Blocks: The smallest census geographic areas, used as basic tabulation areas in urbanized areas and incorporated places with a population of 10,000 or more.

ZIP code areas.

Census governmental geography is an interesting and increasingly important topic for many reasons, in particular for its relationship to Federal revenue sharing policies and congressional redistricting. However, before examining the latter topic in detail, the chapter will introduce several Census

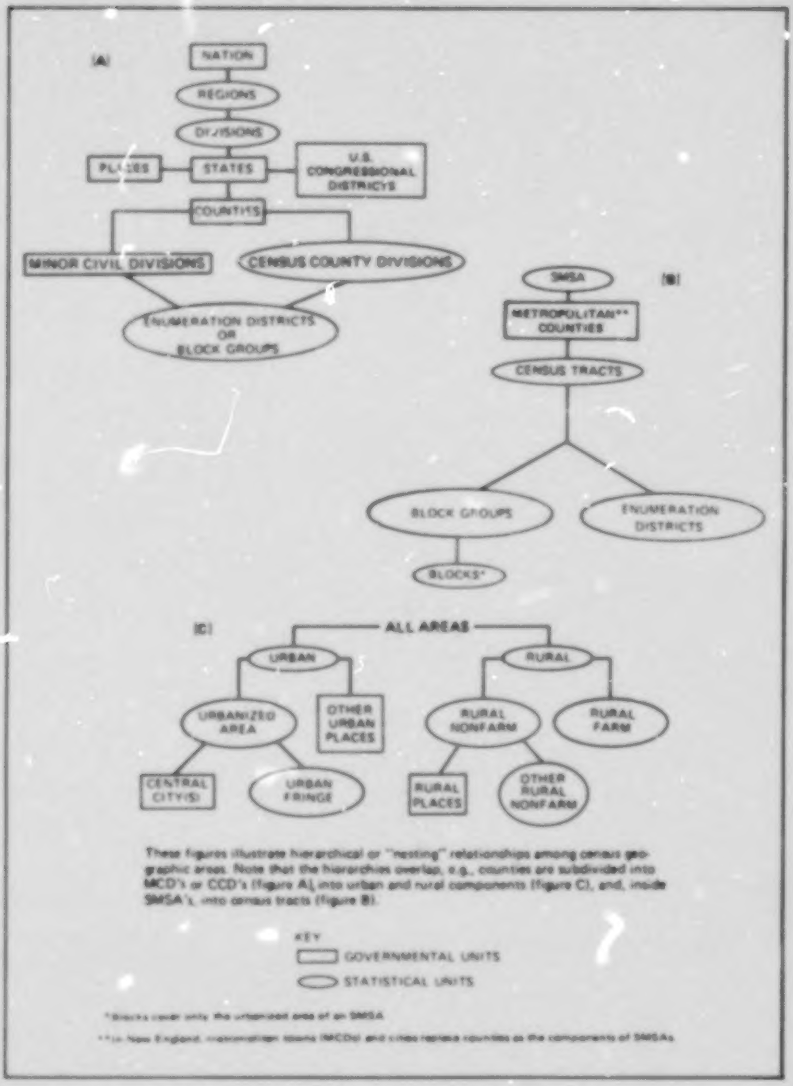
Areas	Censuses										Current programs					
	Population and housing censuses		Census of governments	Economic censuses						Census of agriculture						
	Area reports	Subject reports		Retail trade	Wholesale trade	Selected services	Manufactures	Mineral industries	Construction industries		Population estimates	County Business Patterns	Annual Survey of Manufactures	Current Retail Surveys	Current Population Survey	Annual Housing Survey
United States	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Regions	a	s	a	a	a	a	a	a	a	a	c	c	a			a
Divisions	a	s	a	a	a	a	a	a	a	a	c	c	a			
States	a	s	a	a	a	a	a	a	a	a	a	a	a	s		
SMSA's	a	s	a	a	a	a	a				a	a	s	s		a
Counties	a		a	a	a	a	a	a		a	a	a				
Places	a		a	s	s	s	s						s	s		
MCD's	a															
CCD's	a															
Census tracts	a															
*ED's and block groups	a															
*ZIP code areas	a															
Wards	a															
Blocks	a															
Central business districts	c			a												
Major retail centers				a												

KEY

Note: Other areas unique to the population and housing census are urbanized areas, urban/rural, and congressional districts.

a	All areas.
c	All, by addition of components.
s	Selected areas–larger or with more activity.
*	Not in printed reports.

Figure 4-1. MAJOR GEOGRAPHIC AREAS TABULATED IN SELECTED CENSUS BUREAU PROGRAMS


(A)
NATION
REGIONS
DIVISIONS
PLACES
STATES
U.S. CONGRESSIONAL DISTRICTS
COUNTIES
MINOR CIVIL DIVISIONS
CENSUS COUNTY DIVISIONS
ENUMERATION DISTRICTS OR BLOCK GROUPS
SMSA
(B)
METROPOLITAN** COUNTIES
CENSUS TRACTS
BLOCK GROUPS
ENUMERATION DISTRICTS
BLOCKS*
(C)
ALL AREAS
URBAN
RURAL
URBANIZED AREA
OTHER URBAN PLACES
RURAL NONFARM
RURAL FARM
CENTRAL CITY(S)
URBAN FRINGE
RURAL PLACES
OTHER RURAL NONFARM
KEY
GOVERNMENTAL UNITS
STATISTICAL UNITS

These figures illustrate hierarchical or "nesting" relationships among census geographic areas. Note that the hierarchies overlap, e.g., counties are subdivided into MCD's or CCD's (figure A), into urban and rural components (figure C), and, inside SMSA's, into census tracts (figure B).

*Blocks cover only the urbanized area of an SMSA.

**In New England, metropolitan towns (MCDs) and cities replace counties as the components of SMSAs.

Figure 4-2. SELECTED GEOGRAPHIC UNITS – THEIR HIERARCHICAL RELATIONSHIPS

[illegible]

A general problem for the Census Bureau in all its geographic work is that boundaries change over time. The identification of legal geographic entities (e.g., cities, townships, counties), their names, the location of their boundaries, and the relationship of one legal entity to another (e.g., a municipality being legally independent of or dependent within a township) are essential to the proper location and tabulation of data (see fig. 4-2). As discussed here, a legal area boundary is defined as one established by law, statute, treaty, ordinance, or court ruling. Many legal area boundaries, however, are not static; they constantly change. To update such information, the Census Bureau carries out a number of surveys that include working with local and State agencies. Four of the principle legal boundary surveys focus on:

(1) Municipalities and Minor Civil Divisions

The need for maintaining an up-to-date list of municipalities and their boundaries on a continuing basis resulted in the Census Bureau inaugurating the Boundary and Annexation Survey (BAS) in January 1971. The Boundary and Annexation Survey has two main purposes: (1) To collect and maintain information on the number of local governments and (2) to collect and maintain information on corporate and county boundaries. Both are required for a number of other Bureau of the Census programs and publications as well as for activities of other Federal agencies (fig. 4-3).

In January of each year, each municipality in the survey is furnished with a map showing the latest corporate limits of the municipality according to Bureau of the Census records. Local officials are asked to review the map, update the boundaries, and certify that the boundaries shown reflect the corporate limits as of January 1 of that year.

Each map is accompanied by a questionnaire requesting information about each boundary change, including the type of change (annexation, detachment, merger, etc.), the number of the official ordinance or resolution authorizing the change, the effective date of action, the size of the area, and the estimated population and number of housing units in the area (table 4-1).

(2) Indian Reservations

For the 1980 decennial census, boundary information was obtained for both Federal and State Indian Reservations. For the 241 Federal reservations, the Bureau of Indian Affairs provided certified boundary information based on their interpretation of treaties, statutes, executive orders, and court

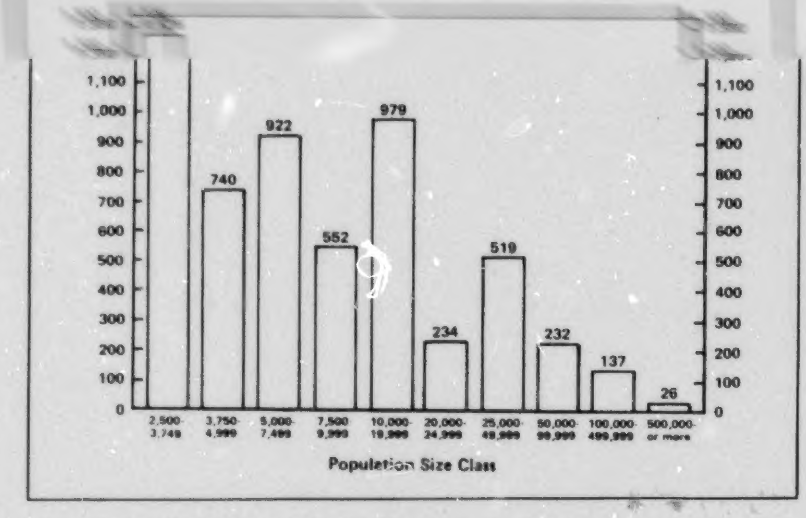


Figure 4-3. NUMBER OF MUNICIPALITIES AS OF JANUARY 1, 1976, BY POPULATION SIZE CLASS

orders. For the 28 State reservations, the appropriate agency within the State supplied the information.

(3) Congressional Districts

Major changes in congressional districts normally occur immediately following each decennial census. This is to be expected, since the constitutional basis for taking the census is to supply information for the apportionment of membership in the House of Representatives among the several States. As the result of the one-person-one-vote ruling by the Supreme Court, changes in congressional districts were quite frequent early in the 1970's—a topic treated at length later in this chapter.

(4) Election Precincts

Public Law 94-171, passed in 1975, states that the Census Bureau shall provide population counts by areas needed for State legislative apportionment. These "areas" are generally the State's election precincts. In those States submitting a plan to be used for legislative apportionment (a set of maps showing election precinct boundaries), the boundaries had to conform to the guidelines established by the Secretary of Commerce and the Census Bureau and be submitted by April 1, 1977. A total of 14 States chose

Table 4-1. Boundary Changes Reported: 1970-1975

Year	Number of changes		Area (square miles)		Population (thousands)	
	Annexations	Detachments	Annexations	Detachments	Annexations	Detachments
Total. .	34,770	546	5,856	273	1,921	59
1970. . . .	4,742	67	682	61	230	5
1971. . . .	5,999	93	940	15	339	1
1972. . . .	6,995	114	1,027	14	526	1
1973. . . .	7,003	75	1,375	30	321	14
1974. . . .	5,441	83	1,179	123	298	34
1975. . . .	4,590	114	659	29	207	5

to participate in this program by submitting a plan for all or part of their State.

Primary Political Subdivisions of the United States

State and State Equivalents

The 1980 decennial census State and State equivalents are: The 50 States and the State equivalents of the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Trust Territory of the Pacific Islands.

County and County Equivalents

Counties are the primary political subdivisions of a State (fig. 4-4). In Louisiana they are referred to as parishes. In Alaska, which has no true county structure, boroughs and census areas (formerly census divisions) are recognized as county equivalents for statistical purposes. In addition, several States (Georgia, Maryland, Missouri, Nevada, and Virginia) contain cities that are independent of any county organization. As such, they constitute primary divisions of their States and are treated as county equivalents. County equivalents also exist for Guam, the Virgin Islands, American Samoa, and the Trust Territory of the Pacific Islands. There were 3,141 counties and county equivalents in the United States tabulated for the 1970 census.

Boundary Definitions for Statistical Areas

The Census Bureau is not responsible for establishing the boundaries of most geographic areas for which it tabulates data. Legal boundaries for States, counties, cities, minor civil divisions (such as townships), election precincts, and wards are established by appropriate authorities.

However, the Census Bureau, in conjunction with local advice, defines a number of statistical areas such as census tracts, census county, divisions, and blocks (see chapter 5). Local Census Statistical Areas Committees (CSAC's) are vital to the Bureau's statistical areas delineation programs. These committees have knowledge about the development of an area, its communities and their interrelationships, and other pertinent characteristics needed to select the most useful boundaries for census tracts and other geographic areas. The membership of the local CSAC's (formerly known as Census Tract Committees) includes representatives from city and county governmental units such as planning, police, health, highway, building permit and inspection, libraries, and boards of education, from economic development councils, councils of governments, neighborhood organizations, universities, social agencies, newspapers, public utilities, and local business firms.

The boundaries of other statistical areas for which census data are tabulated are defined by other Federal agencies. Standard Metropolitan Statistical Areas are defined by the Office of Federal Statistical Policy and Standards of the Department of Commerce. The U.S. Postal Service defines the boundaries for ZIP code areas.

Minor Civil Divisions (MCD's)

MCD's are the primary subdivisions of counties. They include townships, the towns in the New England States, Wisconsin, and New York; and other entities in certain States. MCD tabulations were made for 28 States in 1970 when 24,000 MCD's were recognized by the Census Bureau.

A certain number of MCD's (e.g., townships) have changed boundaries. Some of these changes are a result of municipal annexations in several States. In five States, many MCD boundaries have changed substantially: Virginia, Louisiana, Mississippi, West Virginia and Maryland. A new set of subcounty areas, termed "census subareas," has been developed for Alaska. A significant change in the MCD program for 1980 is that MCD data will be presented in printed reports for Michigan, New York, New Jersey, Pennsylvania, and Wisconsin to the same extent as towns in New England and incorporated places in other States.

Place

The term "place," as used by the Census Bureau, refers to a concentration of population, regardless of the existence of legally prescribed limits, powers, or functions. Most of the places identified in the 1970 census were incorporated as cities, towns, villages, or boroughs.

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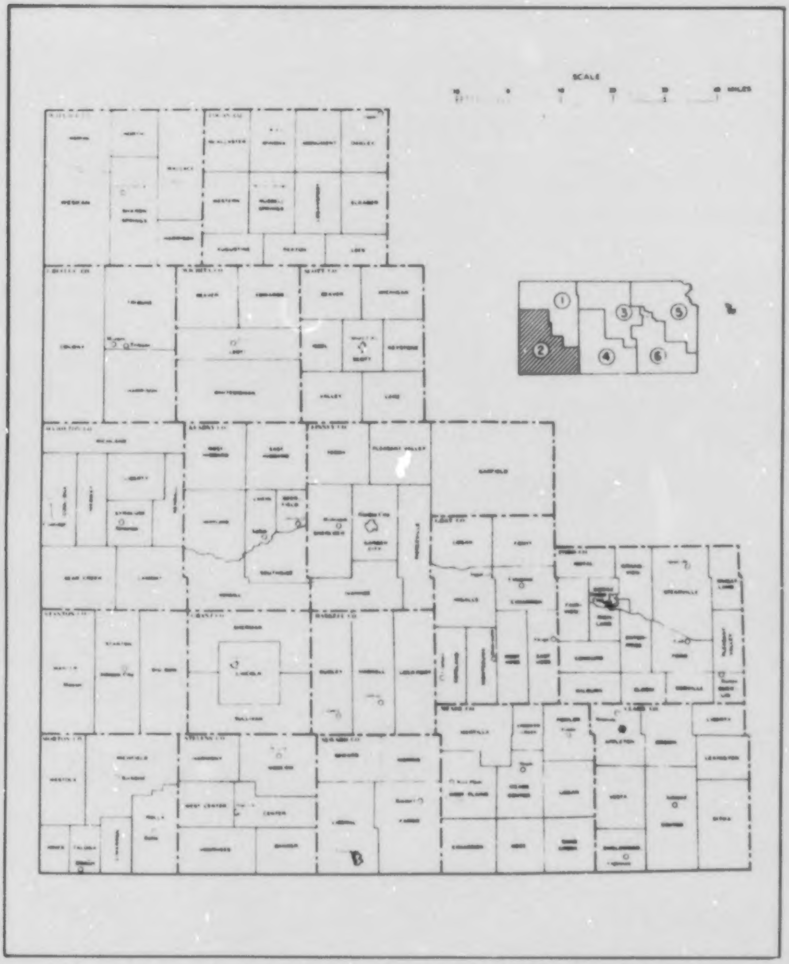


Figure 4-4. PORTION OF A COUNTY SUBDIVISION MAP (Kansas, Section 2)

An incorporated place is a concentration of population with legally defined boundaries and legally constituted governmental functions and includes cities, towns, villages, and boroughs. For special reasons, towns in eight States and boroughs in New York and Alaska are not included.

Places may be in more than one MCD or county but cannot cross State lines. Population statistics are presented for all places in the decennial census.

Wards and Election Precincts

Many incorporated places may be divided into political areas known as wards. Here again, in some cities wards have fairly permanent boundaries and are statistically useful. In others, ward boundaries change frequently. In 1980 total population counts will be tabulated for wards for all incorporated places that have chosen to participate in the ward program. Furthermore, data will be tabulated for election precincts in those States that have chosen to participate in that program.

MAPS FOR SURVEY AND FIELD OPERATIONS

The Census Bureau is not a cartographic agency. However, it is an intensive user of maps produced by others and, therefore, a considerable amount of time is spent in acquiring maps. Very often, the Bureau will not use maps in the form received; they may be updated, boundary lines added or changed, contents combined with other maps, or nonpertinent information removed, all depending upon the needs of the survey or census. There are two major uses of these maps:

(1) *Field operations.* Maps are used as a major reference tool by Census Bureau field personnel. For example, for the 1980 Census of Population and Housing, maps will be used by enumerators (e.g., census takers) throughout the country in the conventional door-to-door enumeration areas and by "followup" enumerators in areas of mail-out/mail-back enumeration to indicate the extent of their assigned work unit (an enumeration district—ED) and to help orient themselves within the enumeration district as they carry out their tasks. Similarly, the supervisors of enumerators will use maps that cover the area under their control.

To accomplish this border-to-border coverage for the 1980 Decennial Census of Population and Housing, the Census Bureau secured over 25,000 map sheets to cover the more than 3,000 counties (or county equivalent areas), individual places outside of metropolitan areas (both incorporated and census-defined unincorporated places), and urban cores of the 288 SMSA's.

(2) *Identifying boundaries.* Maps also serve as a base to identify boundaries of the areas for which data will be collected and tabulated. These include such geographic units as census tracts, incorporated places (e.g., cities and villages), census designated places, minor civil divisions, census county divisions, counties, congressional districts, and States.

(3) *County Maps.* The primary source for maps covering counties and places outside the urban cores of SMSA's are the county maps prepared by the individual State highway departments. While these maps vary in content and format from State to State, they are sufficiently uniform and consistent

to meet the needs of nationwide programs. The Bureau uses recent U.S. Geological Survey (USGS) quadrangle maps to update these highway maps when needed.

Place maps present a challenge for the Census Bureau's mapping program. Not all places are mapped, and in many States there is no regular schedule for updating those place maps that do exist. In an attempt to overcome this problem, the Census Bureau undertook a survey of incorporated places of less than 50,000 population outside of the urban core of SMSA's (approximately 13,000 places). A copy of the best map currently in the Bureau's files was sent to the appropriate municipal office, which was asked to review the map and to specifically determine whether the street patterns and the major drainage features (such as the names of rivers and streams) were up to date. If they were not, the municipality was asked to edit and update the maps or provide one that correctly mapped the community.

Metropolitan Map Series. The other major type of map used is the Metropolitan Map Series (MMS). This series, originated by the Census Bureau, essentially covers the urbanized areas as defined by the Bureau. These metropolitan areas represent 5 percent of the land area of the United States, but contained almost 60 percent of its population in 1970. These maps were developed using USGS quadrangles as the base for mapping streets, roads, railroad tracks, and major drainage features. They were then sent to local cooperating agencies (regional planning agencies, councils of government, county planning agencies, etc.) as part of the GBF/DIME (reference file) program, where they were edited, updated, and returned as part of that operation.

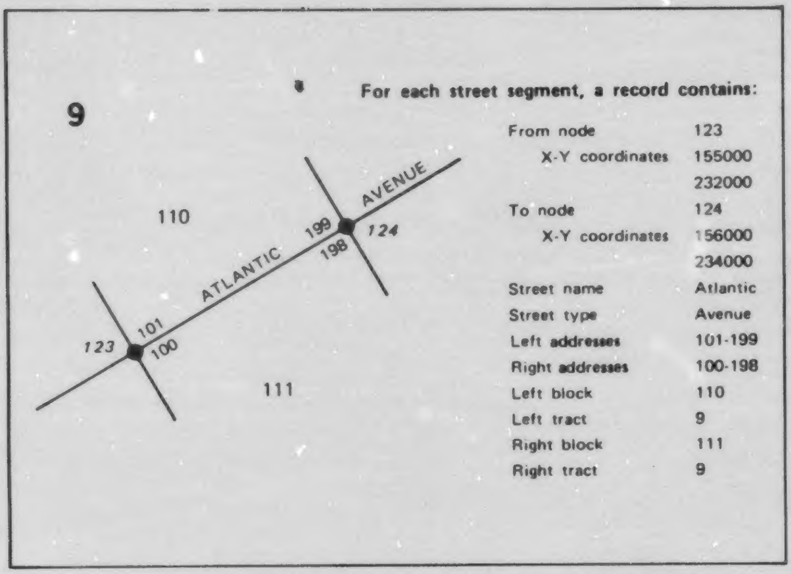
GEOGRAPHIC REFERENCE FILES

Fundamental to the processing of data is the development and maintenance of geographic reference files. These files provide the basis for allocating collected data to their proper geographic "pigeonhole." The Census Bureau has developed a number of reference files organized according to the various uses that will be made of them. A list of the files follows:

-*City Reference File.* This file contains legal geographic entities (place, county, State) and the post office name(s) and ZIP code(s) within each.

-*GBF/DIME Files.* These files are a computerized version of a street map and contain all features shown on the Census Bureau's Metropolitan Map Series, plus block-by-block address ranges, ZIP codes, and x-y coordinate values for each node point on the map (fig. 4-5).

-(*MARF.* The Master Area Reference File (MARF) is the most comprehensive and complete of all publicly available geographic reference files. Included in the file is a complete inventory of all legal geographic entities



For each street segment, a record contains:

From node	123
X-Y coordinates	155000 232000
To node	124
X-Y coordinates	156000 234000
Street name	Atlantic
Street type	Avenue
Left addresses	101-199
Right addresses	100-198
Left block	110
Left tract	9
Right block	111
Right tract	9

Figure 4-5. CONTENTS OF A GBF/DIME-FILE RECORD

(e.g., States, counties, townships, cities), all statistical areas (e.g., SMSA's, census county divisions, census tracts) and all administrative divisions.

APPORTIONMENT AND REDISTRICTING

Each of the topics addressed previously in this chapter is essential for two of the most important uses made of decennial census data: Apportionment and redistricting.

When the Constitution was framed in 1787, the delegates to the Constitutional Convention voted to apportion representation in their new government as well as direct taxation on the basis of population. The population was to be determined by a periodic count. Thus, they wrote a requirement for a census, and implicitly census geography, into the Constitution.

> Representatives and direct taxes shall be apportioned among the several States which may be included within this Union according to their respective numbers. . .The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years in such manner as they shall by law direct. (Article 1, Section 2, of the U.S. Constitution.)

The delegates did specify the distribution of seats in the House of Representatives to each State but not whether there would be districts within the States that elected members of the House would represent. Nor did they specify standards to be used for demarcating the district boundaries. In brief, they did not address the geography of districting. Not until the 1960's did the U.S. Supreme Court rule that Federal and State legislative districts must be of equal population size. How the process of apportionment and redistricting works in America introduces an interesting use of census geography (table 4-2).

Apportionment

Congressional apportionment refers to the process by which seats in the House of Representatives are assigned to the States. The requirements for this are relatively simple; they are apportioned according to the population of each State, with each State having at least one representative.

The decennial census figures are required to be available for the calculation of the apportionment and transmitted to the President by January 1 of the year following the year in which the census is held. The President is then required to submit to Congress a statement showing the number of representatives to which each State is entitled.

Even though it is not mandated by statute, the Census Bureau staff computes the apportionment as a courtesy to the President. Today there is little, if any, controversy about the method of apportionment to each State.

Method of Equal Proportions

The basic problem in reapportionment is to determine the most equitable distribution of the 435 House seats among the States. There is no way of assigning a fractional Representative to a State or of giving a Representative a fractional vote. Nor is there any way by which two States could share the same Representative. To surmount such difficulties and achieve the fairest possible distribution of seats, Congress in 1941 adopted the method of equal proportions. By this method, the proportional differences in the number of persons per representative for any pair of States is reduced to a minimum.

Under the Constitution, each State is entitled to at least one seat in the House of Representatives. Thus, the first 50 seats are fixed. The question then becomes how to divide the remaining 385 seats—which States are entitled to a second, third, fourth, etc. seat? To make the computation according to the method of equal proportions, the apportionment population of each State is multiplied by the decimal of the fraction which is given as

$$\frac{1}{\sqrt{N(N-1)}}$$

where "n" is the number of seats for the State. The result of this multiplication is a number called a priority value.

Table 4-2. Congressional Apportionment, 1789-1970

	Constitution[2] (1789)	YEAR OF CENSUS[1]																	
		1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1930[3]	1940	1950	1960	1970
Ala.				[4]1	3	5	7	7	6	8	8	9	9	10	9	9	9	8	7
Alaska																	[4]1	1	1
Ariz.														[4]1	1	2	2	3	4
Ark.						[4]1	1	2	3	4	5	6	7	7	7	7	6	4	4
Calif.							[4]2	2	3	4	6	7	8	11	20	23	30	38	43
Colo.										[4]1	1	2	3	4	4	4	4	4	5
Conn.	5	7	7	7	6	6	4	4	4	4	4	4	5	5	6	6	6	6	6
Del.	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fla.							[4]1	1	1	2	2	2	3	4	5	6	8	12	15
Ga.	3	2	4	6	7	9	8	8	7	9	10	11	11	12	10	10	10	10	10
Hawaii																	[4]1	2	2
Idaho											[4]1	1	1	2	2	2	2	2	2
Ill.				[4]1	1	3	7	9	14	19	20	22	25	27	27	26	25	24	24
Ind.				[4]1	3	7	10	11	11	13	13	13	13	13	12	11	11	11	11
Iowa							[4]2	2	6	9	11	11	11	11	9	8	8	7	6
Kans.									1	3	7	8	8	8	7	6	6	5	5
Ky.		2	6	10	12	13	10	10	9	10	11	11	11	11	9	9	8	7	7
La.				[4]1	3	3	4	4	5	6	6	6	7	8	8	8	8	8	8
Maine				[4]7	7	8	7	6	5	5	4	4	4	4	3	3	3	2	2
Md.	6	8	9	9	9	8	6	6	5	6	6	6	6	6	6	6	7	8	8
Mass.	8	14	17	[5]13	13	12	10	11	10	11	12	13	14	16	15	14	14	12	12
Mich.						[4]1	3	4	6	9	11	12	12	13	17	17	18	19	19
Minn.								[4]2	2	3	5	7	9	10	9	9	9	8	8
Miss.				[4]1	1	2	4	5	5	6	7	7	8	8	7	7	6	5	5
Mo.					1	2	5	7	9	13	14	15	16	16	13	13	11	10	10
Mont.											[4]1	1	1	2	2	2	2	2	2
Nebr.									[4]1	1	3	6	6	6	5	4	4	3	3
Nev.									[4]1	1	1	1	1	1	1	1	1	1	1
N.H.	3	4	5	6	6	5	4	3	3	3	2	2	2	2	2	2	2	2	2
N.J.	4	5	6	6	6	6	5	5	5	7	7	8	10	12	14	14	14	15	15

Table 4-2. Congressional Apportionment, 1789-1970 (Cont'd)

	Constitution[2] (1789)	YEAR OF CENSUS[1] 1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1930[3]	1940	1950	1960	1970
N.Mex.														[4]1	1	2	2	2	2
N.Y.	6	10	17	27	34	40	34	33	31	33	34	34	37	43	45	45	43	41	39
N.C.	5	10	12	13	13	13	9	8	7	8	9	9	10	10	11	12	12	11	11
N.Dak.											[4]1	1	2	3	2	2	2	2	1
Ohio			[4]1	6	14	19	21	21	19	20	21	21	21	22	24	23	23	24	23
Okla.													[4]5	8	9	8	6	6	6
Ore.								[4]1	1	1	1	2	2	3	3	4	4	4	4
Pa.	8	13	18	23	26	28	24	25	24	27	28	30	32	36	34	33	30	27	25
R.I.	1	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2
S.C.	5	6	8	9	9	9	7	6	4	5	7	7	7	7	6	6	6	6	6
S.Dak.											[4]2	2	2	3	2	2	2	2	2
Tenn.		1	3	6	9	13	11	10	8	10	10	10	10	10	9	10	9	9	8
Texas							[4]2	2	4	6	11	13	16	18	21	21	22	23	24
Utah												[4]1	1	2	2	2	2	2	2
Vt.		2	4	6	5	5	4	3	3	3	2	2	2	2	1	1	1	1	1
Va.	10	19	22	23	22	21	15	13	11	9	10	10	10	10	9	9	10	10	10
Wash.											[4]1	2	3	5	6	6	7	7	7
W.Va.										3	4	4	5	6	6	6	6	5	4
Wis.							[4]2	3	6	8	9	10	11	11	10	10	10	10	9
Wyo.											[4]1	1	1	1	1	1	1	1	1
Total	65	106	142	186	213	242	232	237	243	293	332	357	391	435	435	435	[6]437	435	435

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[1] Apportionment effective with Congressional election two years after census.

[2] Original apportionment made in Constitution pending first census.

[3] No apportionment was made in 1920.

[4] These figures are not based on any census, but indicate the provisional representation accorded newly admitted states by the Congress, pending the following census.

[5] Twenty Members were assigned to Massachusetts, but seven of these were credited to Maine when that area became a state.

[6] Normally 435 but temporarily increased two seats by Congress when Alaska and Hawaii became states.

SOURCE: Biographical Directory of the American Congress and Bureau of the Census.

Priority Values

For example, for 1970 the priority value for a second seat for California was determined by multiplying the apportionment population of the State for that year, 20,098,863, by $\frac{1}{\sqrt{2(2-1)}}$ (or 0.707 10678). The result of this multiplication was 14,212,042. The same computation was then made for New York, which involved multiplying New York's apportionment population, 18,287,529, by the same factor, 0.707 10678. The result was 12,931,236. This operation was repeated for every State. The result for the least populous State, Alaska, was 215,008.

To determine the priority value for each State's claim to a third seat, the population of the State is multiplied by $\frac{1}{\sqrt{3(3-1)}}$ (or.408 24829). The result for California was a priority value of 8,205,326. This process is repeated for every State for any desired number of seats. Thus, to determine the strength of California's claim to a 40th seat, the multiplier was $\frac{1}{\sqrt{40(40-1)}}$ (or 0.025 31848). The resulting priority value for the State in 1970 was 508,873.

When the necessary priority values for all the States have been computed, they are arranged in order, largest first. California, with the largest priority value for a second seat in 1970, received that seat, which was number 51 for the entire House. New York came next in line for a second seat, which was number 52.

The first 10 and bottom 10 priority values and the States involved, calculated by the Census Bureau on the basis of the 1970 census, are shown in table 4-3.

Seat number 435 went to Oklahoma. It was the sixth seat for the State. (If the size of the House were only 60 members, California would have had 4 seats, New York 3, Illinois, Michigan, Ohio, Pennsylvania, and Texas would each have had 2, and all other States only 1). By extending the computation, it became apparent that Oregon's apportionment population of 2,110,810 had a priority value of 471,991 for its fifth seat. This, however, would have been seat number 436 in the House, so Oregon did not get that seat.

Some Two-State Comparisons. The test of fairness of the method of equal. proportions is whether the percentage difference in population per Representative is the smallest possible for any pair of States. Again using the Census Bureau calculations for 1970, States can be compared with each other to test the method.

Table 4-3. Method of Equal Proportions

Size of House	State	Size of State Delegation	Priority Value
51	California	2	14,212,042
52	New York	2	12,931,236
53	Pennsylvania	2	8,403,479
54	California	3	8,205,326
55	Texas	2	7,989,449
56	Illinois	2	7,908,509
57	Ohio	2	7,587,397
58	New York	3	7,465,852
59	Michigan	2	6,319,552
60	California	4	5,802,042
426	Michigan	19	483,268
427	Texas	24	480,908
428	South Carolina	6	477,855
429	Ohio	23	477,016
430	South Dakota	2	476,058
431	Illinois	24	476,036
432	New York	39	475,041
433	Florida	15	473,088
434	California	43	472,947
435	Oklahoma	6	472,043

With six seats for Oklahoma, the average number of persons per Representative was 430,914. The State of Connecticut also was allocated six seats. The average number of persons per seat in Connecticut was 508,449, 17.99 percent more than the average for Oklahoma. But if a seat were taken from Oklahoma and given to Connecticut, the difference in the number of persons per Representative would have been 18.65 percent.

South Dakota received two seats, North Dakota only one. The difference was 85.2 percent in population of congressional districts. However, if the situation had been reversed, North Dakota receiving two and South Dakota one seat, the difference would have been 115.72 percent. In each of these comparisons, the test is met: The proportional difference between the numbers per Representative is smaller for the apportionment as computed than would be the case with alternative methods. A similar comparison could be carried out in relation to the number of Representatives per million of the population, and the results would be the same.

Redistricting

Legislation passed after the census of 1840 provided that representatives were "to be elected by districts composed of contiguous territory equal in number to the Representatives to which said State may be entitled, no one district electing more than one Representative." The 1872 Reapportionment Act again repeated the districting provisions and went even further by adding that districts should contain "as nearly as practicable an equal number of inhabitants." In the act of 1901, the words "compact territory" were added and the clause then read "contiguous and compact territory and containing as nearly as practicable an equal number of inhabitants." Later legislation attempted to solve the representation problems brought about with the increasing urbanization of the country. A major decision was announced on February 17, 1964 when the Supreme Court ruled in the case of *Wesberry v. Sanders* that congressional districts must be substantially equal in population. The court stated that, "as nearly as practicable, one man's vote in a congressional election is to be worth as much as another's."

Malapportionment and Gerrymandering

The prevalence of malapportionment and "gerrymandering" in the creation of the U.S. Congressional districts was, to many observers, one of the chief evils in the American system prior to recent reforms.

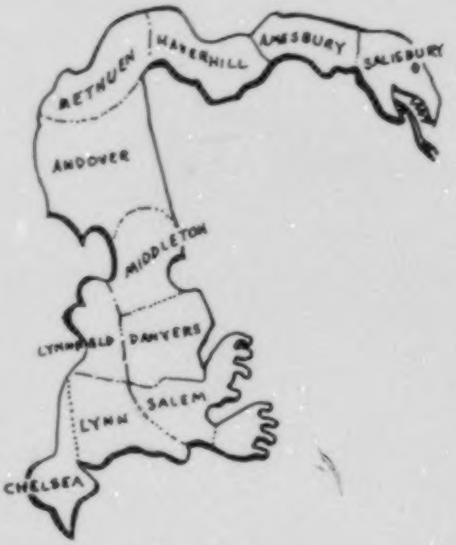
Malapportionment. Malapportionment involved creating districts of grossly unequal populations—either through actions of State legislatures in establishing new districts or, as was the more frequent practice, simply by failing to redistrict despite major population movements that result in population inequalities. At the time of the 1964 Supreme Court decision, for instance, Louisiana had not redistricted since 1912, Colorado and Georgia had not since 1931, and South Carolina since 1932. The result was often that a highly populated district would have no more political "clout" than a sparsely populated district. Each might have only one representative, a situation deemed unconstitutional by the 1964 Supreme Court decision.

Some examples of great disparities in congressional district sizes in modern U.S. history include: New York (1930) 776,425 in largest district and 90,671 in smallest district; Ohio (1946) 698,650 and 163,561; Illinois (1946) 914,053 and 112,116; Arkansas (1946) 423,152 and 177,476; Texas (1962) 951,527 and 216,371; Michigan (1962) 802,994 and 177,431; Maryland (1962) 711,045 and 243,570; and South Dakota (1962) 497,669 and 182,845.

The decennial census and ensuing reapportionment of House seats eventually forced reapportionment in most States, although some resorted to the expedient of electing Members at Large (like Texas, Hawaii, Ohio, Michigan, and Maryland in 1962) rather than face the process of redrawing district lines.

Gerrymandering. Gerrymandering was the name given to excessive manipulation of the shape of legislative districts (fig. 4-6).

Like malapportionment, gerrymandering is practiced by both political parties. In 1961, for example, Republican redistricters in New York created one gerrymander-like creature stretching across the greater part of upstate New York, its head hanging over Albany in the east and its tail reaching for Rochester in the west. Such salamander, tadpole and fishlike creatures sprang to life on the maps of New York City's boroughs. In California, Democrats in control of the Legislature connected two pockets of strong Republican strength in Los Angeles by a thin strip of land to form an unwieldly district running for miles along the coastline. In North Carolina,



The name "gerrymandering" originated in 1812.

In that year, the Massachusetts Legislature carved out of Essex County a district that historian John Fiske said had a "dragonlike contour." When the printer Gilbert Stuart saw the misshapen district, he pencilled in a head, wings, and claws and exclaimed: "That will do for a salamander . . .'—to which editor Benjamin Russell replied: "Better say a Gerrymander"—after Elbridge Gerry, then Governor of Massachusetts.

Figure 4-6. THE GERRYMANDER

Democratic redistricters formed an almost perfect gerrymander shape to throw the State's sole Republican Representative in with a strong Democratic opponent.

The basic intent of practically every gerrymander is political: To create a maximum number of districts that will elect the party candidates or types of candidates favored by the controlling group in the State legislature that does the redistricting. The effect is almost always to increase the political power of the already politically dominant group.

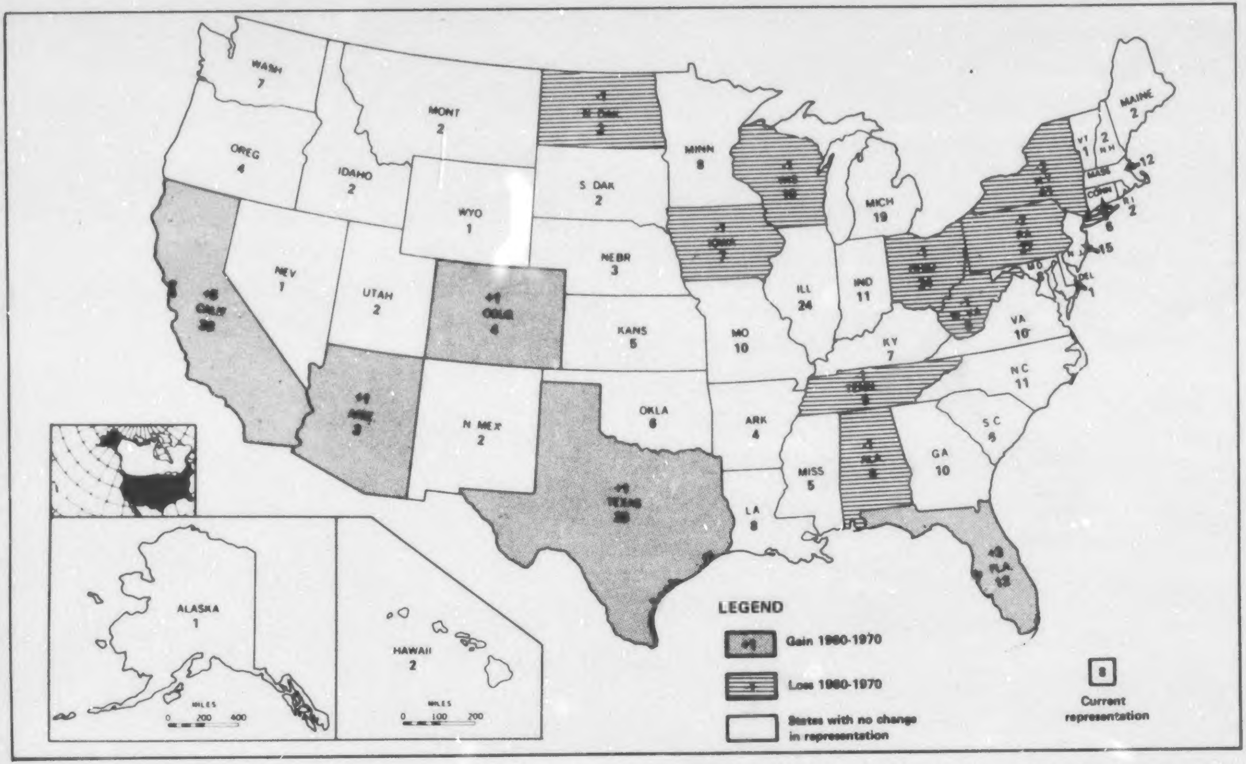
State Redistricting

Apportionment of representatives within each State according to population provides another example of boundary selection. It is here that Supreme Court rulings beginning in 1962 have had a dramatic effect. Determining congressional districts within a State is the responsibility of the State legislature. Prior to the 1960's the concept of census-count equality in each district was unheard of in the majority of the States. Michigan serves as a good example of this. According to the 1960 census, Michigan's 16th Congressional District had a population of 802,994, whereas its 12th District contained 177,431 people. In effect, those living in the 12th District had four-and-a-half times as much representation in Washington, for all congressmen have an equal vote once they are sworn in as members of the House of Representatives. To put it another way, if the residents of the 16th District were regarded as having one vote each, their counterparts in the 12th District were able to cast what amounted to four-and-one-half votes. This pattern was repeated in varying degrees of difference throughout every State in the Union.

The consequences of perpetuating archaic district lines was to penalize, through underrepresentation, citizens living in sections of a State that had been growing in population. By 1960, for example, the average value of the vote of a resident of a heavily populated county was equivalent to 44 percent of the value of the vote of a resident of a sparsely populated county.

Effects of One-Person-One-Vote Rule

The end of this practice was decreed in March 1962 by a six to two vote of the Supreme Court. The case *Baker v. Carr* was brought by a group of Nashville, Tenn. citizens, who claimed they were denied equal representation in the State legislature because of the districting structure in Tennessee. The court sided with them and ruled that they had a legal right to sue for equal participation in the selection of their lawmakers, a ruling that came to be known as the one-person-one-vote rule. The court did not go so far as to say how "equal" participation had to be. This task was handed over to the lower courts.


WASH
7
OREG
4
MONT
2
IDAHO
2
WYO
1
NEV
1
UTAH
2
+1
COLO
+5
CALIF
+1
ARIZ
N MEX
2
S DAK
2
NEBR
3
KANS
5
OKLA
6
+1
TEXAS
MINN
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-1
IOWA
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MICH
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KY
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-1
TENN
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ALA
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OHIO
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CONN
6
R I
2
MASS
12
VT
1
2
N H
MAINE
2
ALASKA
1
MILES
0
200
400
HAWAII
2
MILES
0
100
200
LEGEND
Gain 1960-1970
Loss 1960-1970
States with no change in representation
8
Current representation

Figure 4-7. CHANGES IN CONGRESSIONAL REPRESENTATION BY STATES: 1960 to 1970

Table 4-4. Population Gain/Loss 1970-1978

(Population in thousands)

Congressional District	1978 Population	Percent Increase 1970-1978	Rank	Congressional District and City	1978 Population	Percent Loss 1970-1978
California 43rd	761	63.9	1	New York 21st (New York)	285	–39.1
Texas 7th	759	62.9	2	Michigan 13th (Detroit)	332	–28.7
California 40th	742	59.9	3	Ohio 21st (Cleveland)	347	–24.9
Florida 5th	717	58.2	4	New York 12th (New York)	372	–20.4
Florida 10th	716	58.0	5	Missouri 1st (St. Louis)	378	–19.3
Florida 11th	696	53.8	6	New York 37th (Buffalo)	380	–18.7
Arizona 3d	634	43.0	7	New York 19th (New York)	380	–18.5
Florida 4th	628	38.8	8	Illinois 8th (Chicago)	377	–18.1
Colorado 4th	600	35.6	9	Minnesota 5th (Minneapolis)	397	–17.3
Nevada (at large)	628	35.0	10	Michigan 1st (Detroit)	389	–16.8
Arizona 4th	592	33.4	11	Pennsylvania 14th (Pittsburgh)	392	–16.7
Texas 3d	621	33.1	12	Pennsylvania 3d (Philadelphia)	397	–15.9
Colorado 2d	584	32.8	13	New Jersey 10th (Newark)	403	–15.8
Alaska (at large)	403	31.6	14	Illinois 1st (Chicago)	392	–15.2
Arizona 2d	582	31.3	15	New York 14th (New York)	397	–15.0
Georgia 9th	593	29.7	16	Maryland 7th (Baltimore)	418	–14.4
Florida 8th	579	28.1	17	Illinois 7th (Chicago)	404	–13.1
Colorado 5th	565	27.9	18	Georgia 5th (Atlanta)	401	–12.9
Texas 21st	596	27.8	19	Illinois 11th (Chicago)	403	–12.6
Georgia 6th	582	27.7	20	Pennsylvania 1st (Philadelphia)	419	–12.5

Texas 22d	596	27.7	21	Kentucky 3d (Louisville)	406	–11.7
Wyoming (at large)	424	27.4	22	Maryland 3d (Baltimore)	434	–11.6
Florida 12th	575	27.0	23	Michigan 16th (Detroit)	413	–11.3
Illinois 12th	585	27.0	24	Ohio 20th (Cleveland)	410	–11.3
New York 1st	594	27.0	25	Missouri 3d (St. Louis)	419	–10.5
Texas 2d	592	26.9	26	New York 16th (New York)	419	–10.5
Texas 10th	592	26.9	27	Missouri 5th (Kansas City)	420	–10.1
California	589	26.8	28	New York 15th (New York)	420	–10.0

Population Estimates Indicate Extensive Congressional Redistricting After 1980.

Census Bureau estimates of the 1978 population of congressional districts suggest that extensive redrawing of district boundaries will be needed after 1980. Numerous districts will need to be redrawn to ensure that all districts within a State are approximately equal in population. Under the one-person-one-vote principle established by the Supreme Court, State authorities are required to achieve a high degree of equality, and some courts have decreed that a district's population should not deviate more than 1 percent from the average district population for that State.

Following 1970 redistricting, 402 of the 435 districts were within less than 1 percent of the district average for the States in which they were located. The 1978 estimates indicate that only 40 of the districts were within 1 percent of the average for the State in which they were located. Furthermore, 109 districts deviated by more than 10 percent.

It should be emphasized that the number of districts that will need redistricting cannot be forecast with certainty because (1)the latest figures are merely estimates and they may miss the mark in many cases by 3 percent or more; and (2) 14 States, including some of the most populous, probably will need to redistrict anyway because they will gain or lose congressional seats.

About three-fourths of the 435 districts had population gains during 1970-78. Six showed increases of more than 50 percent, and 30 had increases greater than 25 percent. The fastest growing congressional districts—all in the Sunbelt—have been California's 43rd (San Diego), with a 64 percent increase; the 7th Texas district (Houston), 63 percent; California's 40th (Orange County), 59.9 percent; and Florida's 5th, 10th, and 11th districts with 58.2 percent, 58.0 percent, and 53.8 percent, respectively.

A total of 106 districts are estimated to have lost population since 1970, most of them are in big cities. Fifteen are in New York, seven in Chicago, seven in Los Angeles, and five each in Philadelphia and Detroit. More than two-thirds of the districts losing population are in six States—California, New York, Ohio, Pennsylvania, Illinois, and New Jersey.

Results of the 1980 census also will probably require reapportionment of congressional seats among the States. On the basis of the 1978 estimates, the following States would gain seats in the House (the number of seats is in parentheses): California (2), Texas (2), Florida (2), and Utah, Oregon, Tennessee, Washington, and Arizona (1 each). The following would lose: New York (4), Ohio (2), Illinois (2), and Pennsylvania, Michigan, and South Dakota (1 each).

The 1964 Supreme Court ruling *Wesberry v. Sanders* extended the one-person-one-vote concept to congressional districting as well. The opinion states that "While it may not be possible to draw congressional districts with mathematical precision, that is no excuse for ignoring our Constitution's plain objective of making equal representation for equal numbers of people the fundamental goal for the House of Representatives." These and subsequent court decisions have now firmly established that any redistricting must primarily reflect population equality based on the decennial census figures. Changes in congressional representation by States, 1960 to 1970, are shown in fig. 4-7.

There is one further point regarding State legislative redistricting that needs mentioning. The court's have indicated that the standard of population equality for State legislative redistricting is not as strict as that for congressional redistricting. Some deviation from the equal population principle may be justified so long as the divergences "are based on legitimate considerations incident to the effectuation of a rational state policy."

The Bureau's Role

With the equal population principle firmly established as a basis for legislative redistricting, an accurate and up-to-date census of population has become more crucial than ever. Congress, reflecting the importance of the census of population in the redistricting process, enacted in 1975 an amendment requiring those responsible for the legislative apportionment or redistricting of each State to submit to the Secretary of Commerce a plan identifying the geographic areas for which specific tabulations of population are desired. This plan must be submitted not later than 3 years prior to the census date and must be developed in a nonpartisan manner."

In the context of these judicial and legislative decisions and the need for equitable population redistricting, the importance of the decennial census cannot be overstated. The completeness and accuracy of population counts from every section of the country will directly affect the voting strength of every citizen. The more complete and accurate the count from every State the more certain it is that each district will have equal representation in the State legislature and in Congress. Conversely, if there is a significant undercount in any area, the results will correspondingly lessen the effect of the people's vote in that area (see table 4-4).

SUMMARY

A limitation of political geographic areas from the standpoint of the analysis of population distribution is the fact that the boundaries may be rather arbitrary and may not consider important physiographic, economic, or social factors. Moreover, the areas officially designated as cities may not correspond very well to the actual physical city in terms of population settlement, or to the city as a functional economic unit. Furthermore, the smallest type of political areas do not provide adequate geographic detail for ecological studies or city planning. Therefore, various types of statistical and functional areas have been defined (often by the Census Bureau in cooperation with State and local governments and other groups), to meet these needs.

Recommended Readings

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Chapter 5

GEOGRAPHY FOR A CHANGING SOCIETY

STATISTICAL AREA CONCEPTS

While census data tabulated by legal geographic entities such as States, counties, and cities are sufficient to satisfy many census data users, information for these jurisdictions alone does not meet all census users' needs.* As a result, a number of statistical geographic concepts and methods have evolved over the last century in response to the changing information needs of American society. Today the concepts are applied at all geographic scales including regions, metropolitan and urban areas, and small geographic areas (e.g., census blocks, census tracts).

The importance of statistical geographic areas and their boundaries has increased over recent decades as the demand for small-area data increases, as Federal and State legislation ties administration of public laws to census data and/or geographic areas, and as greater operational and tabulation control of small geographic area data is required. While the types and number of statistical geographic areas in use by the Census Bureau change in response to our Nation's needs, each new area represents the application of basic methodological principles—the overriding theme of this chapter.

Basic Principles

Two fundamentally different principles are used to define statistical areas. One defines a statistical area by the similarity of its component parts—the homogeneity principle. The other defines a statistical area by the presence of a nucleus and an area of influence—the functional integration principle (e.g., a central city and its commuter suburbs).

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*. For example, a data user may be interested in population and economic information about the Minneapolis-St. Paul, Minn. metropolitan area, even though this area is statistically comprised of 2 cities, several independent suburbs, and 5 counties.

Homogeneity Principle

Applying the homogeneity principle requires grouping together in a single statistical area those parts that have similar characteristics and separating those that are different. Often the differences along the border are not sharp, and careful judgment is required to ensure that the similarities in characteristics relate to population, economy, land use, or physical environment. Frequently, a combination of homogenous characteristics are used to select boundaries; an approach that uses statistics, maps, field work, and aerial photographs for developing smaller statistical areas.

Statistical areas delineated on the homogeneity principle are particularly useful for analyzing trends as well as differences between areas. These areas include Census Bureau tabulations of special purpose district data for the economic censuses (e.g., industrial water-use regions, fishing regions, lumber industry regions, and oil and gas districts).

Census Physical Regions

In the 19th century the United States was divided by the census staff into physical regions (lowland, highland, wetland, dryland, woodland, and grassland). These regions reflected the attempt to understand and classify the linkages between natural environments and the population statistics, economies, subcultures, and political characteristics of the primarily agricultural Nation. Statisticians of the period felt it was desirable to have statistics for each of these physical regions, rather than the data separated only into political divisions. Thus began the statistical geography process that is still underway in the Census Bureau.

The present geographic divisions have been used since 1910, and the four regions since 1942. The objective in establishing these State groupings is described as follows: "The States within each of these divisions are for the most part fairly homogeneous in physical characteristics as well as in the characteristics of their population and their economic and social conditions, while on the other hand each division differs more or less sharply from most others in these respects. In forming these groups of States the lines have been based partly on physical and partly on historical conditions." [1] (See fig. 5-1.)

1. Census Regions—There are *four regions, each composed of two or three divisions:*

   West: Pacific and Mountain Divisions

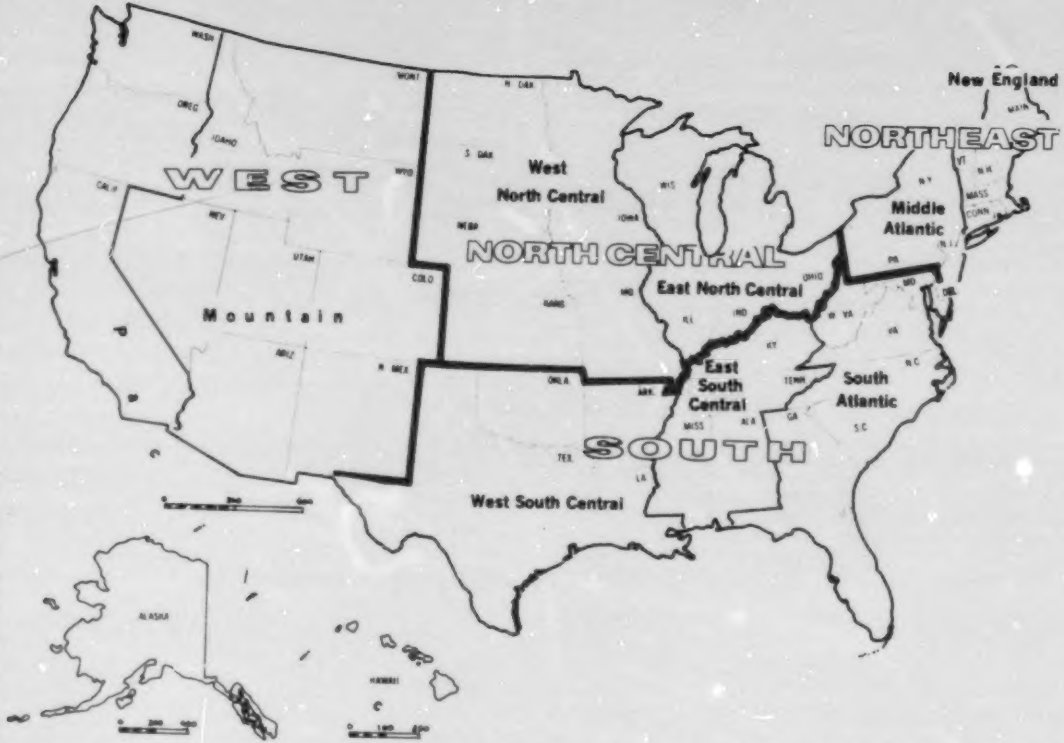
   South: South Atlantic, East South Central, and West South Central Divisions

   North Central: West North Central and East North Central Divisions

   Northeast: Middle Atlantic and New England Divisions

Census regions should not be confused with the 10 Federal administrative regions.

2. Divisions—Census geographic divisions are areas composed of *Groupings of contiguous States*; there are nine divisions, and summary statistics have been presented for these largely unchanged areas since 1910. Data are presented only in U.S. summary reports and in selected subject reports.


WEST
Mountain
Pacific
NORTH CENTRAL
West North Central
East North Central
NORTHEAST
New England
Middle Atlantic
SOUTH
South Atlantic
East South Central
West South Central
WASH
OREG
IDAHO
MONT
WYO
CALIF
NEV
UTAH
COLO
ARIZ
N MEX
N DAK
S DAK
NEBR
KANS
IOWA
MO
MINN
WIS
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OHIO
N Y
PA
N J
VT
N H
MAINE
MASS
CONN
MD
DEL
W VA
VA
N C
S C
GA
KY
TENN
ALA
MISS
OKLA
ARK
TEX
LA
ALASKA
HAWAII

Figure 5-1. CENSUS REGIONS AND GEOGRAPHIC DIVISIONS OF THE UNITED STATES

Functional Integration Principle

A statistical area delineated on the functional integration principle comprises a central nucleus and all the area that is organized around it that generally operates as a unit. Functional areas include metropolitan areas, community and neighborhood areas, tribal areas, trade areas, traffic flow areas, and all other areas that are integrated through communication or movement of one kind or another.

Integration, like homogeneity, may be based on a single factor or a group of related factors, and it may be difficult to measure. While statistics are collected on movements, commuting, traffic flow, trading patterns, or communications, few are readily available or published in comparable formats. What is available is often difficult to interpret. Yet considerable information on the extensiveness of statistical areas may be obtained through field observation, interviews, and mapping of the results. Such techniques are valuable in defining areas properly.

Use of Principles

In the delineation of most statistical areas, both the homogeneity and functional integration principles are used to some extent. The difference in their use is mainly in emphasis. For example, census tract criteria emphasize homogeneity but also recognize the importance of such major barriers as railways, freeways, waterways, and topography, which often separate one community from another. Indeed, some census tracts are recognized as communities, planning areas, employment districts, or central business districts. In the case of metropolitan areas, the classification criteria are divided into two kinds: (1) Those concerned with identifying metropolitan characteristics, including population size and density, concentration of work places, and other specified activities, and (2) those concerned with economic and social integration between the central city and outlying areas in terms of daily commuting to work, shopping, and communication.

Boundary and Area Criteria

While homogeneity and functional integration principles are basic to the selection of criteria for the delineation of statistical areas, many other factors require careful consideration, including boundary selection and area definition. Among these are:

(1) *Number of areas.* How many areas are necessary for the analysis of census data? It is simpler to create only a few statistical areas if one seeks an overall impression of a large area. On the other hand, for certain statistical functions, it is desirable to have as many areas as possible.

(2) *Size of areas.* Closely related to number of areas is the size of areas. "Size," as used here, usually refers to population size (or to the amount of economic activity within an area in the case of economic censuses). For small statistical areas, particularly, it is important that each is of sufficient size to ensure that meaningful data can be provided.

(3) *Equality of land area.* Comparable land areas are important in understanding population distributions. When delineating small statistical areas, it is desirable to divide very large areas with low population density into as many statistical areas as feasible. Rough equality of land area facilitates the presentation of statistics in cartographic form.

(4) *Shape of areas.* Compactness of shape is a desirable quality in statistical areas, particularly for functional-type areas, so that the peripheral parts are about equal distances from the centers. In twisted or elongated areas, there is the possibility that the statistical characteristics of the extensions may be quite different from those of the center. Irregularities of shape also can be a distinct handicap in cartographic presentation.

(5) *Completeness of grid.* Completeness of grid (a term that describes the horizontal and vertical reference lines on a map) refers to the land area coverage of the various types of statistical areas. To be of use, major regions and subregions must usually cover the entire country, that is, have complete grid coverage. Metropolitan and urban areas are selected areas distinguished from the rest of the country and therefore do not have complete grid coverage; but their selection from all parts of the country must be defined on a comparable basis. Small statistical areas such as census tracts and blocks are normally limited to metropolitan or other urban areas and thus lack a nationwide grid. Where defined, they should completely cover the metropolitan or urban area.

(6) *Definitions of Area Boundaries.* Boundaries should be definite, well known, and easily identifiable through observation or inquiry in the field; otherwise, the accurate collection and tabulation of data are impossible.

(7) *Contiguity of Area.* Each statistical area should consist of one contiguous area. This is a very sound principle to follow; however, like all good rules, there can be a few exceptions, such as small enclaves and a few administrative exclaves that ordinarily do not cause problems. (An exclave is a portion of an administrative area that is separated from the main part.)

(8) *Recognition of Area.* To all users of statistical areas, it is important to be able to easily recognize each area under analysis; that is, to know its general location and limits. For this reason, statistical area identification maps are usually provided by the Census Bureau in its publications. Recognition is also aided by giving names to statistical areas, especially the larger types such as major regions and metropolitan areas. The names should be descriptive of the area in terms of major features or places, preferably names that are known and already used. For small statistical areas such as census tracts this is ordinarily not

possible, and identifying numbers must be assigned; as a result such areas can be located only by using a census area identification map.

(9) *Precision of Definition.* Certain statistical areas are more precisely defined than others in terms of their principles of definition, whether homogeneous or functional.

The boundaries of a homogeneous area may be sharp and may easily distinguish the area from its surroundings; however, the area is more likely to have transition zones between it and its environs. The same is likely to be true for functionally integrated areas.

TYPES OF STATISTICAL AREAS

The term statistical area generally is limited to those areas that are specifically defined to represent geographic regions, metropolitan areas, or smaller nongovernmental areas. Statistical areas may represent groups of governmental units or they may be formed without regard to official boundaries and thus comprise parts of several administrative districts.

Statistical areas are classified in numerous ways. Considering how they have developed historically, it is useful to recognize their difference in terms of relative size and function. There are three types of areas in use by the Census Bureau: (1) Regions and divisions, (2) metropolitan and urban areas, and (3) small geographic areas.

Regions and Divisions

Division of the United States into a few major physical regions for the presentation of statistics during the 1880's was the first recognition of a need for census statistical areas. Such regionalization is particularly

Region

Generically, "region" implies some kind of functional economic area or a cultural area rather than a political unit. Among the factors on which regions are delineated are physical features, climate, type of soil, type of farming, culture, and economic levels and organizations. The cultural and economic factors include ethnic or linguistic differences, type of economy, and levels of organizations. The objective of defining certain categories of regions may be to distinguish homogenous regions—with minimal differences within regions and maximal differences among regions from relatively self-contained regions where a large city or urban complex is economically dominant over a hinterland.

Subregions. The term "subregion" or "subarea" has been popularly used in two ways: (1) To denote the subparts of a region (larger than a State) that may cut across State lines, and (2) to denote subparts of a State. In either case, the delineation of the subregions may be based on any one or any combination of a number of types of criteria—agricultural, demographic, economic, social, or cultural. Moreover, subregional boundaries may be coincident with county lines or they may cut across county lines.

required in the United States, a country having 51 1st-order divisions (States and the District of Columbia). Summary data for a few regions can be analyzed and compared quickly, whereas the data for 50 States will take time to comprehend.

The boundaries of States may not be ideal for separating the major regions or subregions; but for a summary set of geographic areas, precision of definition is less important than continuity over time. Since the boundaries of States, once established, do not generally change over the period of several censuses, they are valuable for trend analysis.

For its publications, the Bureau of the Census uses two levels of State groupings. The 50 States and the District of Columbia are divided into 9 groups, identified as "geographic divisions." These in turn are further divided into four groups identified as "regions" (fig. 5-1).

Metropolitan and Urban Areas

It is often necessary to distinguish between urban population and rural population. Generally speaking, urban population is regarded as that population living in closely spaced settlements and not engaging in agricultural occupations. One of the major difficulties in defining urban population is that city boundaries (established for administrative purposes) rarely delimit the actual extent of urban settlement. This is not a new problem for the Census Bureau; it has been around since at least 1850. (See comments by the Director of the 1850 census about cities, towns, and counties.)

Comments by the Director of the 1850 Census About Cities, Towns, and Counties

The Census does not furnish material for separating the urban and rural population of the United States, so as to admit of a statement showing the extent of either. Such a table to each of the States would be very valuable, and it is much to be regretted that it can be deduced from none of the census publications.

So imperfect is the census of 1850 in this respect that hundreds of important towns and cities in all parts of the country, and especially in the South and West, are not even distinguished on the returns from the body of the counties in which they are situated, and therefore their population cannot be ascertained at all. . . the greatest cause of embarrassment is the fact that in New England and the northern States, what are returned as cities and towns often include whole rural districts. If the information in regard to town and city population is ever to be correctly ascertained, there must be explicit instructions to separate upon the returns, distinctly, all places having an aggregation of over 50 or 100 persons, with a store, tavern, blacksmith shop, school house, and post office, or some or all of these, and to include within such village, town, or city no person not resident within its limits proper. It would not be difficult to frame suitable instructions upon this point.

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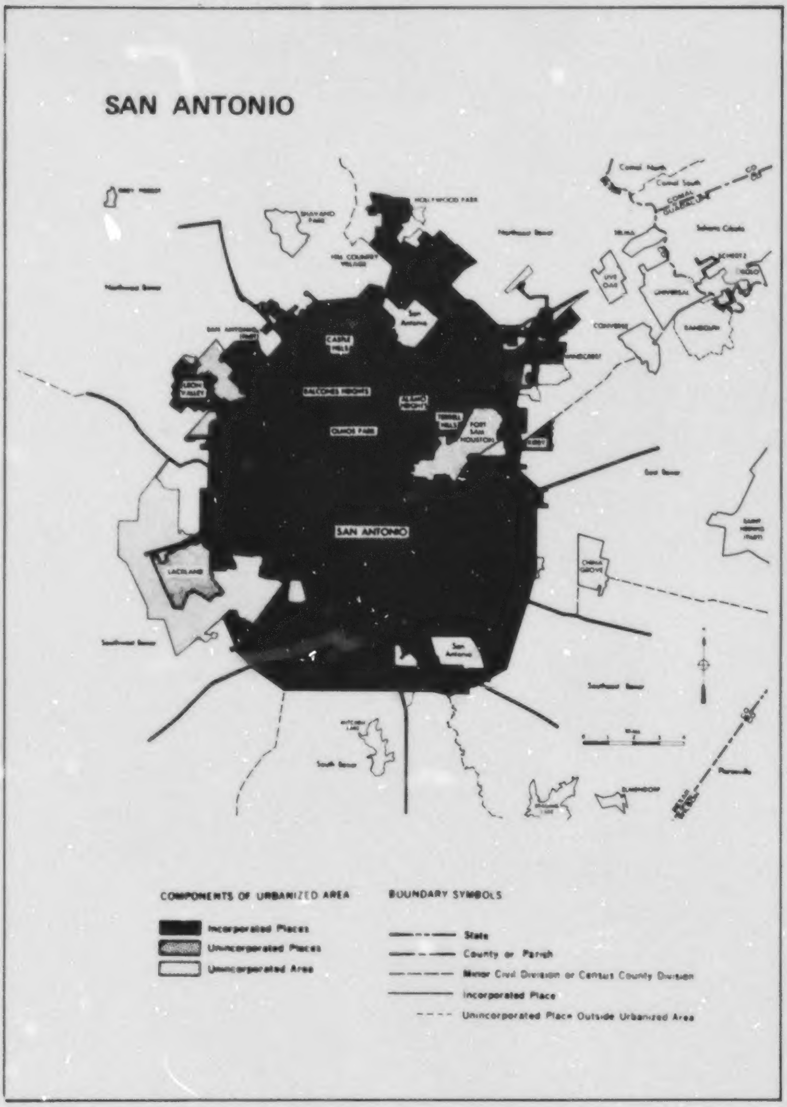
SAN ANTONIO
SAN ANTONIO
CASTLE HILLS
BALCONES HEIGHTS
OLMOS PARK
ALAMO HEIGHTS
TERRELL HILLS
FORT SAM HOUSTON
LEON VALLEY
LACKLAND
CHINA GROVE
LIVE OAK
CONVERSE
San Antonio
COMPONENTS OF URBANIZED AREA
Incorporated Places
Unincorporated Places
Unincorporated Area
BOUNDARY SYMBOLS
State
County or Parish
Minor Civil Division or Census County Division
Incorporated Place
Unincorporated Place Outside Urbanized Area

In some States and counties, the cities or municipalities include considerable rural areas and population. In other States and counties, cities fail to include considerable urban population outside their limits. In the first case, the city could be called overbounded and in the second case,

SAN ANTONIO URBANIZED AREA

	Population	
	1970	1960
The area	772,513	641,965
San Antonio city	654,153	587,718
Outside central city	118,360	54,247
The area is defined as follows:		
Bexar County (part)	772,513	641,965
East Bexar division (part)	2,905	*
Kirby city	2,558	*
Northeast Bexar division (part)	10,767	1,029
Hill Country Village town	636	*
Hollywood Park city	2,299	*
Windcrest town	3,371	*
Northwest Bexar division (part)	7,934	*
Leon Valley city	1,960	*
San Antonio division	688,593	618,944
Alamo Heights city	6,933	7,552
Balcones Heights city	2,504	950
Castle Hills city	5,311	2,622
Fort Sam Houston (U)	10,533	*
Olmos Park city	2,250	2,457
San Antonio city	654,153	587,718
Terrell Hills city	5,225	5,572
South Bexar division (part)	1,829	718
South Bexar division (part)	60,485	21,274
Lackland (U)	19,141	*

*Not applicable

underbounded. One way of correcting for these conditions is to develop statistical areas that carefully bound the urban areas on the basis of high population density. In the United States, such statistical areas are called urbanized areas and are named after the principal city or cities.

1970 UA's

In 1970, 120.7 million (about 60 percent) of the total U.S. population were living within the boundaries of urbanized areas (UA's) as they were defined in 1970. However, these areas covered only 36,290 square miles, or about 1 percent of the total land area of the United States.

More than half of the UA population (65 million) lived in the 340 central cities, whereas 56 million were in the urban fringe—the remainder of the UA outside the central city or cities. The population density of all UA's combined was 3,327 persons per square mile, with an average density of 4,399 persons per square mile in the central cities and 2,589 in the urban fringe. By contrast, the density was 24 persons per square mile outside UA's and 57 for the United States as a whole in 1970.

There was considerable variation among individual UA's in terms of population, land area, and density. Populations ranged from just over 50,000 to more than 16 million for the New York, N.Y.—Northeastern New Jersey urbanized area, with the majority of areas totaling less than 150,000. Densities of individual UA's vary from a low density of 847 persons per square mile to a density of nearly eight times as high in the New York area (6,683). The median land area and density are 63.1 square miles and 2,600 persons per square mile, respectively.

Urbanized Areas (UA's)

Urbanized Areas are defined by population density. Each UA includes a central city and the surrounding closely settled urban fringe (suburbs) which together have a population of 50,000 or more.

The Census Bureau's major objective in delineating urbanized areas is to provide a better indicator of urban and rural populations in the vicinity of the larger cities and more meaningful urban/rural census counts for the county, State, and Nation.

Using data from the 1980 census, the Census Bureau will define urbanized areas for those cities with large concentrations of population adjacent to the city limits.

Extended Cities

In recent years, there has been an increasing trend toward the extension of city boundaries to include territory essentially rural in character (for example, by city-county consolidations). The classification of all the inhabitants of such cities as urban would include in the urban population persons whose environment is primarily rural in character. To classify these rural area people from those residing in the closely settled portions of such cities, the Bureau of the Census examined patterns of population density and classified a portion or portions of each city as rural in 1970. These cities—designated as extended cities—thus consist of both an urban part and a rural part.

An extended city is defined as a city that contains one or more areas, each of at least 5 square miles in extent, and with a population density of less than 100 persons per square mile, according to the 1970 census. These areas constitute at least 25 percent of the land area of the legal city or a total of 25 square miles or more.

Extended Cities

Examples of extended cities: Millville, Ringwood, and Vineland, N.J.; Freemont, Hayward, Palo Alto, San Diego, San Jose, and Union City, Calif.; Jacksonville, Miramar, and West Palm Beach, Fla.; Archbald, Pa.

The delineation of extended cities in 1970 was limited to cities within urbanized areas. When an extended city is a central city of an urbanized area, only the urban part is considered as the central city.

Standard Metropolitan Statistical Areas (SMSA's)

Closely linked to the urbanized area concept is the concept of the standard metropolitan statistical area (SMSA). An SMSA consists of one or more entire counties economically and socially integrated that have a large population nucleus (fig. 5-2 and 5-3).

The criteria for delineating the 288 SMSA's to be used in the 1980 census specify that an SMSA includes at least:

1) One central city with 50,000 inhabitants or more, or

2) A central city with at least 25,000 inhabitants provided that two conditions exist:

a) that the city's population taken together with that of contiguous places totals at least 50,000 inhabitants and constitutes for general economic and social purposes a single community, and

b) that the county or counties in which these places are located have at least 75,000 inhabitants.

1980 census data will be tabulated for these 288 SMSA's, plus additional areas that qualify for SMSA status based on 1980 population counts. In

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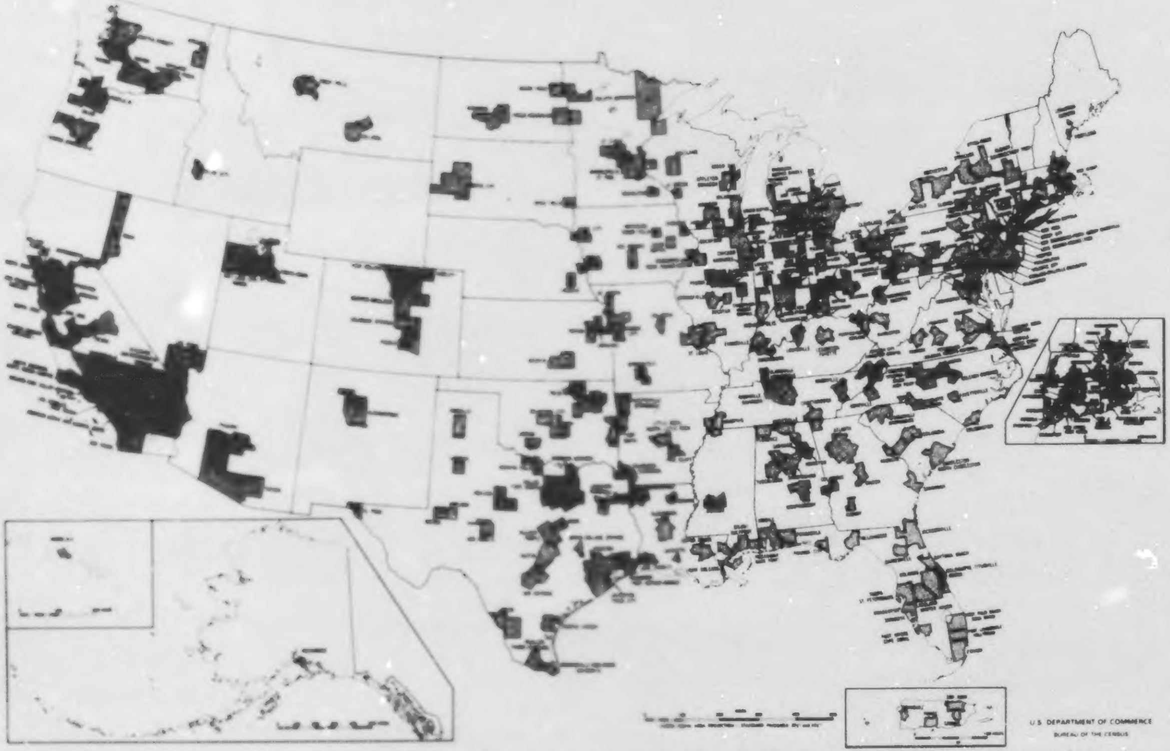

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

Figure 5-2. SMSA's DEFINED FOR 1980 CENSUS

Central City and Urban Fringe

The urbanized area population is sometimes divided for tabulation purposes between "central city" and "urban fringe." The urban fringe is that portion of an urbanized area lying outside the political boundaries of the central city or cities.

anticipation of new criteria to be put into effect after the 1980 census (discussed below), the conditions for the establishment of a new SMSA are: (1) Its central city reaches 50,000 population, *or* (2) its urbanized area reaches 50,000 population *and* it is located in a county or counties with 100,000 population. Contiguous counties will be included in SMSA's if they are socially and economically interdependent with the central county of the SMSA.

An SMSA may cross a State boundary. Counties that comprise an SMSA are called metropolitan counties. Counties that do not lie in an SMSA are called nonmetropolitan. (See fig. 5-4.)

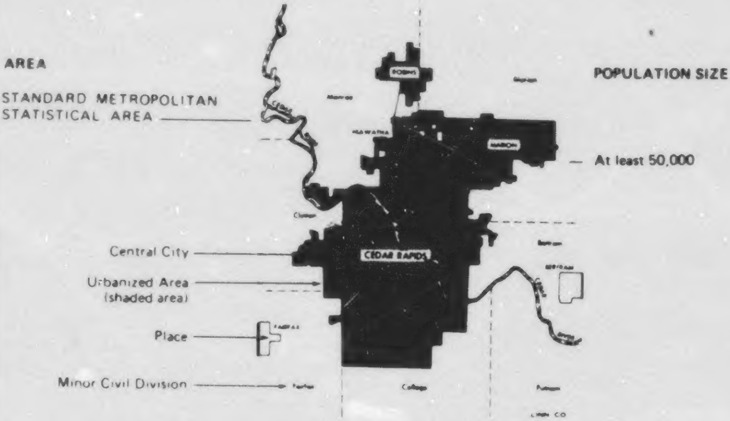

AREA
STANDARD METROPOLITAN STATISTICAL AREA
Central City
Urbanized Area (shaded area)
Place
Minor Civil Division
POPULATION SIZE
At least 50,000
HIAWATHA
MARION
CEDAR RAPIDS
College
LINN CO

Figure 5-3. CENSUS GEOGRAPHIC AREAS — METROPOLITAN

Standard Consolidated Statistical Areas (SCSA's)

An SCSA is an area used to facilitate the presentation and analysis of data for concentrations of metropolitan population. It includes two or more contiguous standard metropolitan statistical areas that meet specific criteria of size, urban character, integration, and contiguity of urbanized area. In 1972 the two in existence were called standard consolidated areas.

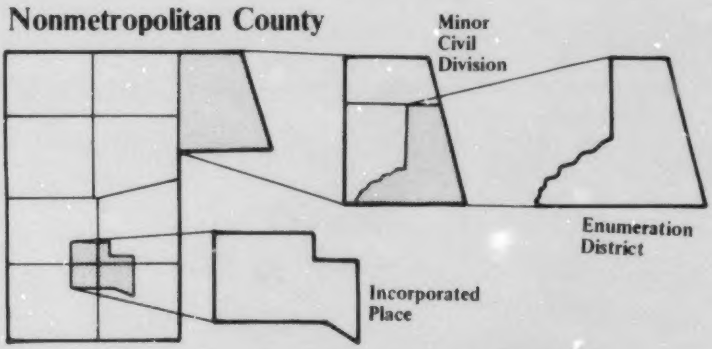
The two standard consolidated areas recognized in the 1970 census, metropolitan complexes around New York and Chicago, were retitled and, in the case of New York, redefined to become SCSA's. In addition, 11 new SCSA's were established in 1976, each comprising an SMSA of at least one million population plus one or more adjoining SMSA's related to it by continuously developed high density population corridors and/or metropolitan commuting of workers.

The SCSA's as now defined are:

1. Boston-Lawrence-Lowell, MA-NH
2. Chicago-Gary, IL-IN
3. Cincinnati-Hamilton, OH-KY-IN
4. Cleveland-Akron-Lorain, OH
5. Detroit-Ann Arbor, MI
6. Houston-Galveston, TX
7. Los Angeles-Long Beach-Anaheim, CA
8. Miami-Fort Lauderdale, FL
9. Milwaukee-Racine, WI
10. New York-Newark-Jersey City, NY-NJ-CT
11. Philadelphia-Wilmington-Trenton, PA-DE-NJ-MD
12. San Francisco-Oakland-San Jose, CA
13. Seattle-Tacoma, WA

Urban v. Rural

Urbanized areas plus all places outside urbanized areas with 2,500 or more inhabitants comprise the urban areas of the United States. Everything else is classified as rural.



For those counties that are not part of a SMSA, the subcounty geography is slightly different because, in most cases, census tracts do not exist in those counties. In each county where there are no census tracts the next level of census geography is the minor civil division or the census county division. Also, within many counties are places. These may coincide with a minor civil division or census county division or be a subordinate part of a MCD or CCD. Each place and each minor civil division or census county division is comprised of one or more enumeration districts. The enumeration district is the smallest geographic area for which data will be tabulated in most nonmetropolitan areas. However, blocks and block groups will be tabulated for incorporated places with populations of 10,000 or more.

Figure 5-4. SMALL AREA GEOGRAPHY FOR NONMETROPOLITAN AREAS

Metropolitan Statistical Areas (MSA's)

Two kinds of changes to SMSA's will take place sometime in 1982 or 1983. First, methodological refinements will be introduced into the SMSA definition through new criteria, and the term "standard" will be dropped to simplify the title to "metropolitan statistical area (MSA)."

Second, the boundaries of current SMSA's will be reexamined in light of 1980 census commuting and population density data and in terms of the new criteria. These changes will be issued in a separate report late in 1983.

Small Geographic Areas

A major type of statistical grouping includes the various small areas used for detailed analysis of metropolitan or urban areas and, in some instances, of rural areas. These include such areas as census tracts, city blocks, central business districts, school districts, planning areas, communities, neighborhoods, voting precincts, and the like. Not all of these areas are recognized in census publications.

The criteria for small statistical areas is similar to that for large areas. The need again is to make available separate statistical data for individual areas having common characteristics. At this level, areas can be more finely differentiated on the basis of social and economic characteristics—in other words, more homogeneous and less homogeneous. As a result, small statistical areas provide data to focus sharply on such local concerns as housing needs, health and welfare conditions, adequacy of education, employment, marketing, and distribution of goods.

Census County Divisions (CCD's)

CCD's are statistical subdivisions of a county defined for those States where minor civil divisions are not appropriate for the publication of statistics.

Census Designated Places (CDP's)

CDP's are residential concentrations whose population considers itself belonging to a geographically defined "place," although the "place" is not legally incorporated.

Census Tracts (CT's)

Census tracts are statistical subdivisions of an SMSA with an average population of 4,000. A discussion of their history and use follows later in this chapter, after other small area geography terms are defined.

Blocks

Each census block is a well-defined piece of land bounded by streets, roads, railroad tracks, streams, or other features on the ground. It is the smallest area for which census data will be tabulated. Only selected statistics based on the complete count part of the census are published. No sample data are available at the block level.

Block statistics will be tabulated for all urbanized areas, all incorporated places of 10,000 or more population, and any other areas that have contracted with the Bureau to provide block-level data. In fact, five States have contracted for block-level data for the entire State. These are Rhode Island, New York, Virginia, Georgia, and Mississippi. An estimated 2.5 million blocks will be defined for 1980. This is an increase of nearly 50 percent over the number of blocks for which data were published in 1970. Each block is identified by a three-digit number which is unique within a census tract. In blocked areas where there are no census tracts (e.g., for most cities outside [illegible]MSA's) "block numbering areas" are defined as substitutes for census tracts for use in identifying blocks.

Some blocks defined for 1970 will have new boundaries in 1980, primarily those on the edges of urbanized areas and other areas of new development where the street patterns have physically changed. Wherever a block has been redefined, by splitting or other adjustment, the 1970 block number will generally not be reused so as to help the user notice the change. In most areas, however, block boundaries and numbers will be the same in 1980 as in 1970, except for a few areas where blocks were renumbered by local GBF/DIME coordinating agencies to define more desirable block groups. These comparability tables may also become available on tape.

Block Groups (BG's) and Enumeration Districts (ED's)

Intermediate in size between census tracts and blocks are block groups (BG's). While the definition of these areas does not take social or economic factors into account, these subdivisions of census tracts are useful since more data become available (on computer tape and microfiche) than are available for individual city blocks. A typical census tract might consist of 4 block groups (range 1 to 9) that in turn might average 10 blocks each (range 1 to 99). Block groups are not specifically outlined on Census Bureau maps—they are defined by the first digit of each three-digit block number. For example, all blocks numbered in the range of 101 to 199 would constitute block group 1. Block groups exist only where city blocks are defined for census tabulation purposes. In all other areas, the Bureau's administrative "enumeration districts" are used in the preparation of tabulations parallel to those for block groups.

Enumeration districts (ED's) are areas used in the geographic control of enumeration activities. An ED is the territory assigned to a single enumerator to cover. In areas where the census is collected by conventional door-to-door enumeration, an enumerator can cover about 250 housing units or about 800 persons. In those areas where most census activities are conducted by mail, an enumeration district includes about twice as many households on the average.

All ED's and BG's observe the boundaries of higher level geographic entities. Thus ED's and BG's are subdivisions of (or are equal to) census tracts, cities or towns, minor civil divisions or census county divisions, counties, and all other higher level entities (except congressional districts).

Other Geographic Areas

Neighborhood Statistics

The Bureau is initiating a new program (the Neighborhood Statistics Program) for 1980. Certain summary statistics will be tabulated for officially recognized neighborhoods in municipalities of 10,000 or more population that choose to take part in this voluntary program. The neighborhoods will be defined by local officials in terms of census tracts and census blocks. The data available to the municipalities will be similar to those in the census tract reports.

ZIP Code Areas

In 1980 census data will again be available by ZIP code areas that are defined by the U.S. Postal Service. Data will be available nationwide for 5-digit ZIP codes on computer tape and microfiche only. In 1970, ZIP code data were provided at the 5-digit level in metropolitan areas, but only the 3-digit level in nonmetropolitan areas. ZIP code areas have no predictable relationship to census tracts, city blocks, or other census geography. Maps of ZIP code areas are not published except in large city telephone directories.

Indian Reservations

Data will also be tabulated for 269 Federal and State Indian Reservations in 1980. This will be the first decennial census for which the Bureau has systematically identified the boundaries of Indian Reservations.

Central Business Districts (CBD's)

A CBD is an area of very high land valuation characterized by a high concentration of retail business, shops, stores, theaters, and hotels, and by an area of high traffic flow. A CBD is defined to follow existing census tract lines; i.e., it consists of one or more whole census tracts. CBD's are identified only in SMSA central cities and other SMSA cities with populations of 50,000 or more and are designated by the local Census Statistical Areas Committees in consultation with the Census Bureau. However, some eligible cities do not have a CBD because they chose not to participate in the CBD delineation program.

Data summaries for CBD's do not appear in any report from the census of population and housing. However, each *Census Tracts* report includes in its introduction a definition of any local CBD's in terms of the numbers of component census tracts. The user can therefore prepare his or her own CBD summaries from data in the *Census Tracts* report. In addition, CBD's are recognized as destinations in tabulations of journey-to-work data in *Census Tracts* reports.

CENSUS TRACTS

Earlier, it was pointed out that statistical geography concepts and methods evolved in response to the changing information needs of American society.

The development of the census tract concept illustrates this process. Census tracts are subdivisions of counties and contain an average population of approximately 4,000, but may range in population from 2,500 to 8,000. The actual delineation of tracts is carried out by local Census Statistical Areas Committees made up of local data users, with the Bureau providing general guidelines, detailed review, and approval of the plans to maintain an overall uniform standard. Census tracts have been established for all counties within the current 288 SMSA's and in a number of other highly populated counties that have expressed an interest in the program. There are over 40,000 census tracts for the 1980 census. (See fig. 5-5 for the census tracts in the Columbia, S.C. SMSA.)

While the basic tenet has been to keep census tract boundaries as stable as possible, some modifications are necessary from time to time if the census tracts are to continue to be useful and usable. Each proposed modification is considered in terms of its impact on the usefulness to the tract program, its effect on the reliability of data, whether other means are available to meet the particular need without having to alter the tract boundaries.

CENSUS TRACT HISTORY

Dr. Walter Laidlaw may well be regarded as the originator of census tracts. In his work with the New York Federation of Churches in the early 1900's he needed population data and other information for areas smaller than the New York boroughs. He used Census Bureau tabulations by State assembly districts and other governmental and private sources of data; he also collected his own data on families, religious affiliations, nationalities, churches, and church institutions. Since an important part of his plan was to compare data for a given small area with data for the same area at an earlier date, the usefulness of all his information was impaired when, in 1905, the State changed the boundaries of the assembly districts.

In 1906 Dr. Laidlaw explained his problem in an article published by the New York Federation of Churches. "If the Federation were to adopt the new outlines," he wrote, "It would be compelled to drop into limbo all the results of the Federal Census of 1900 and its own studies of it. . .If the Federal Census of 1910 should adopt the new outlines as its unit, it would again be compelled to say, as in 1900, that no comparison can be made with the previous decennial census."

The answer, Dr. Laidlaw concluded, was a division of New York City into permanent areas. He devised a plan of areas and persuaded the Bureau of the Census to tabulate population data for these areas in the 1910 census. The New York City Tenement House Department and the Department of Health gave him active support. These areas he later called census tracts.

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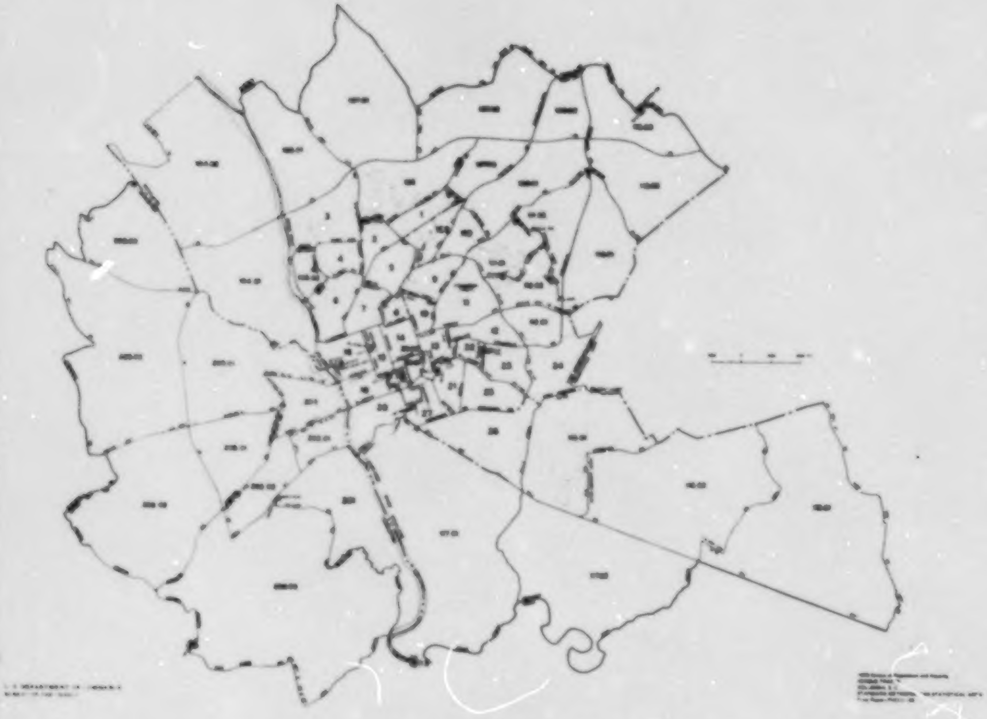

Figure 5-5. CENSUS TRACTS IN THE COLUMBIA, S.C. SMSA.

From the results that followed, it appears that Dr. Laidlaw devised an important tool for use in the study of urban areas. For the 1910 census, seven other cities (Baltimore, Boston, Chicago, Cleveland, Philadelphia, Pittsburgh, and St. Louis) were divided into tracts, and the Bureau of the Census tabulated population data for the tracts in these eight cities. Data by tracts were tabulated for the same eight cities in 1920. Ten cities were added in the 1930 census and 42 more in 1940. The 1950 census recognized census tracts in 114 large cities (population of 50,000 inhabitants or more) and in adjacent areas of some of these cities.

Until 1940, the Census Bureau collected but did not publish the data by census tracts; each city paid for its own tabulation. By 1940 the Census Bureau was convinced that the usefulness of the statistics justified the expenditure of public funds and published census tract reports for most of the tracted cities. This practice was repeated in 1950, 1960, and 1970.

To a great extent, tracts have developed in the way that Dr. Laidlaw started them. A local committee divides the city into small areas, each being as homogeneous as possible in population and housing. The Bureau of the Census collects, tabulates, and publishes the data, together with an outline census tract map. The local committee provides maps and other materials to make the statistics meaningful. In addition, the local committee encourages the city, the businessleaders, the health and welfare agencies, and the research groups to keep their records and statistics on a tract basis. The growth in the number of tracted areas and the many uses of tract statistics reflect the growth of these local communities.

The growth did not occur spontaneously. While Dr. Laidlaw, a clergyman, invented the census tract idea and started it on its way, it was Howard Whipple Green, a statistician from Cleveland, who contributed in a special way to the widespread adoption and use of census tracts. For over 25 years Mr. Green sought, as a service to the statistical profession and to his country's cities, to persuade local leaders to establish census tracts and then to use the data in solving their problems in government, business, health, welfare, education, and other fields. It was not until 1956, 3 years before Mr. Green's death, that the Bureau of the Census at his request assumed full responsibility for further expanding the census tract program. Since then, Census Bureau staff members have encouraged local groups to establish census tracts in new areas.

HIERARCHICAL RELATIONSHIPS

There are hierarchical relationships among the geographic units used by the Census Bureau. Some of these relationships are demonstrated in fig. 4-2. As they indicate, governmental units and statistical units intermingle (e.g., States are grouped to define the statistical divisions and regions; political jurisdictions such as counties are subdivided into statistical units called enumeration districts and block groups). Metropolitan counties are the basic building blocks for Standard Metropolitan Statistical Areas. As figure 4-2 also demonstrates, both urban and rural populations may live in SMSA's as well as nonmetropolitan counties, demonstrating that metropolitan/nonmetropolitan and urban/rural are not interchangeable concepts.

Note that part B of figure 4-2 is accurate only for SMSA's outside New England. For New England, "metropolitan minor civil divisions" replace "metropolitan counties."

Urbanized areas are generally smaller than the SMSA's of the same name, since they exclude all rural areas and those urban places not contiguous to or integrated with the urbanized area. Some urbanized areas do have minor segments extending beyond the SMSA limits, and the New York–Northern New Jersey and the Chicago–Northeastern Indiana urbanized areas treat as a whole the urbanized area in two or more integrated SMSA's. Only in the case of "extended cities" do urbanized areas cross place boundaries, by excluding the rural area in the place. Some new urbanized areas to be created from the 1980 census will be in counties that fail to meet SMSA criteria.

Almost all areas to be reported in the 1980 census can be defined as an aggregation of enumeration districts or blocks, making it possible to analyze almost all area interrelationships completely. For example, if a place and a major civil division partially overlap one another, the area of intersection can be defined and studied separately. If a tract crosses a city boundary, data will be available separately for that part of the tract inside the city and that part outside the city. If an urbanized area lies in more than one county, basic data will be derivable for each county component of the urbanized area.

This hierarchical structure is partly an artifact of the area definition process and partly a result of the way certain 1980 census tabulations have been designed. Enumeration districts, being defined for administrative purposes for data collection, are designed so that they never cross a place, MCD, CCD, census tract, or county boundary. On the other hand, blocks and block groups, which replace enumeration districts as summary areas in the more densely settled areas, are initially defined to observe only physical features and disregard lines of political jurisdiction where they are not readily visible. However, when the most basic tabulations are made from the 1980 census (Summary Tape Files 1 and 3—see chapter 10), separate summaries will be prepared for the components of block groups that cross place, MCD, or CCD boundaries. Block summaries will observe the boundaries of all places and of MCD's in 20 northern States where MCD's serve as general purpose governmental units. More detailed summaries for census tracts (Summary Tape Files 2 and 4—see chapter 10) will observe only the boundaries of places of 10,000 or more inhabitants, however less detailed files (STF's 1 and 3) will show tract parts observing all place and MCD or CCD boundaries.

HISTORICAL COMPARABILITY

One of the great virtues of the decennial census data base is that it provides a time series spanning nearly two centuries and makes possible many fruitful historical studies. Over the last several decades census content and census-taking methodology have been sufficiently consistent to support a wide range of historical studies for small areas as well as the Nation as a whole. Unfortunately, 1980 census reports contain relatively few of the possible historical comparisons. Except for population and housing counts for counties and places, 1980 reports will present time-series comparisons on a subject-by-subject basis only at the national and State levels, and only for 1970 and 1980. But, since data published from previous censuses are readily available in major libraries, the researcher can construct many decade-to-decade comparisons for most of the types of geographic areas discussed in chapters 4 and 5.

The major limitation on such comparisons is that many governmental and statistical geographic areas have changed boundaries over time. In other words, data from the various decades may not be truly comparable if the area in question has been redefined between the successive time periods.

Governmental Areas

Counties

While county boundaries are normally considered to be very stable over time, a number of changes have occurred in recent decades. Between 1970 and 1980 the most numerous changes have occurred in Virginia as a result of the creation of new independent cities or annexations by independent cities. Also a new set of county equivalents has been defined for Alaska (boroughs and census areas), which in some cases differ considerably from the divisions recognized for 1970.

Incorporated Places

Cities in many States annex territory from time to time, and the annexation policies they use vary widely from State to State. Nearly 65 percent of all incorporated municipalities annexed territory between 1970 and 1977, and this proportion will increase by January 1, 1980, which is the reference date for boundaries in the 1980 census. In the 1960 and 1970 censuses, enumeration district boundaries were so defined as to allow a user to reconstruct data for each city of 2,000 or more inhabitants as defined in 1960. There will not be a corresponding capability in the 1980 census. Instead, a special report on annexations will be issued covering central cities, other places of 50,000 or more population, and any smaller places that annexed areas with 1,000 or more inhabitants as of 1970. Working with data from the Boundary and Annexation Survey, the Bureau will determine or estimate the 1970 population of each area annexed by a city. The special report will compare the 1970 and 1980 population of each covered city as defined in 1980 (forward comparability), and, additionally, will make a similar comparison for each city as defined in 1970 (backward comparability) with 1970 boundaries approximated using 1980 block statistics. This will be the first census in which forward comparability has been provided.

Minor Civil Divisions

A certain number of minor civil divisions (e.g., townships) have changed boundaries since 1970. Some of these have been as a result of municipal annexations in several States. In five States, many MCD boundaries have changed substantially: Virginia, Louisiana, Mississippi, West Virginia, and Maryland. A new set of subcounty areas, termed "census subareas," has been developed for Alaska. North Dakota's townships being reported in 1980 were not observed in 1970 census tabulations. Since more data is being published for minor civil divisions in the 1980 census than in the 1970 census, it may be necessary to retrieve comparable 1970 data from computer summary tapes.

Statistical Areas

SMSA's

SMSA data have been reported in the 1950 and 1960 as well as the 1970 censuses (for 1950, they were termed Standard Metropolitan Areas). Since SMSA's outside of New England are defined in terms of whole counties, it is normally possible to reconstruct census data for an SMSA according to any time period from any data base providing county data. Changes to the boundaries of established SMSA's have occurred primarily 2 to 3 years after the 1960 and 1970 censuses as new counties were added based on community data from the censuses.

Since the 1970 census, when 247 SMSA's were tabulated (including 4 in Puerto Rico), 41 new SMSA's have been defined. Of the 247 1970 SMSA's, 101 have been redefined by the addition of one or more counties (or towns in New England), one has been redefined by the addition of one area and the deletion of another (Wichita Falls, Tex.), one has been subdivided (Nassau-Suffolk SMSA was created from a part of the New York SMSA), four pairs of SMSA's were combined into single SMSA's (for example Dallas-Fort Worth, Tex.), and four SMSA's lost area that was added to larger SMSA's. No further SMSA boundary changes will be made until after 1980 census data are published, but a number of new SMSA's can be expected to qualify based on 1980 population counts, and these new SMSA's will be fully incorporated into the 1980 publication program.

In 1982 or 1983 another round of substantial changes to SMSA boundaries can be expected, based upon two causes:

1) New 1980 data on commuting patterns from outlying counties into the SMSA's core counties; and

2) New criteria governing the inclusion of outlying counties.

The new criteria will have a significant impact, especially since they are expected to cause the deletion of some marginal counties from existing SMSA's as well as additions to other SMSA's. The term "Standard" will be dropped, and MSA's will replace SMSA's.

The new criteria will also feature a two-tiered approach in some of the larger metropolitan areas. Adjacent, highly integrated MSA's meeting certain criteria will be combined into a Consolidated Metropolitan Statistical Area, while retaining their individual identities as component Primary Metropolitan Statistical Areas.

Urbanized Areas

By their nature, urbanized areas are likely to change from decade to decade, since they follow the extent of dense development around a core area. Urbanized areas cannot be redefined between censuses, since population density for very small areas governs area definitions.

In 1960 and 1970 there had to be a central city (or twin cities under certain conditions) with 50,000 or more inhabitants for an urbanized area to be defined around it. In 1980 the minimum population criterion no longer applies to the central city or cities, but rather to the area as a whole. In other words, if there is a closely settled area with a total population of 50,000 or more, it doesn't matter whether that population exists inside a single municipal boundary or whether the area consists of a cluster of adjacent smaller communities. When considering decade-to-decade changes in a single urbanized area there is no problem, since corresponding rules were used in determining the extent of that area. On the other hand, when considering urbanized areas as a group across the country, a small part of their increase from 1970 to 1980 will be attributable to this rule change.

Census Designated Areas

"Census designated place" is a new term for 1980, replacing the term "unincorporated places" recognized in 1970 and earlier censuses. The new terminology makes it more explicit that such places are defined by the Census Bureau, and avoids confusion in States where many "unincorporated places" are parts of incorporated towns or townships. Many census designated places have been redefined since 1970. The number of census designated places, about 2,100 in 1970, is expected to increase for 1980.

Census County Divisions

Census county divisions (CCD's) are defined in 20 States where there are no MCD's suitable for census purposes. This number is one fewer than for the 1970 census, since North Dakota is returning to the use of townships. In SMSA counties, many CCD's have been extensively revised to conform with census tract boundaries insofar as possible. In other counties, CCD's have also been changed in an attempt to avoid future CCD boundary adjustments caused by annexation to incorporated places.

Census Tracts

Since 1970 there has been an expansion in the number of tracted counties, in part because the number of counties in SMSA's has increased, and it is Census Bureau policy to tract all SMSA counties. In addition, more than 200 counties outside SMSA's have also taken the initiative and defined census tracts. In fact, five States have been entirely tracted: Rhode Island, Connecticut, New Jersey, Delaware, and Hawaii.

Census tracts are defined with an overall goal of census-to-census comparability. Some 1970 tracts have been subdivided due to increased population, but the new tracts can be recombined by the user for comparison with 1970 tracts. This affects about eight percent of all 1970 tracts. Other changes have included combinations of two or more small 1970 tracts (less than one percent of all 1970 tracts) and adjustments of tract boundaries. Only in a few areas did local Census Statistical Area Committees undertake a wholesale redifinition of census tracts.

1970-1980 tract comparability tables will be prepared and published as part of the *Census Tracts* reports. All tracts for which boundaries or identification changed between 1970 and 1980 will be listed, but it will be necessary to compare 1970 and 1980 maps for more specific information about boundary changes.

Census tract data are available for many areas back to the 1940 census, although the program has increased in scope each decade.

Block Groups and Enumeration Districts

Data are available for 1970 block groups and enumeration districts, but these areas are not necessarily the same as the 1980 block groups and enumeration districts. Many of the areas which have block groups in 1980 were subdivided into enumeration districts in 1970.

Because ED's are administrative units used for field operation and for tabulation control, their boundaries are not the same from one decennial census to the next. This is due to changes in boundaries that must be recognized, changes in operational procedures, and shifts in population. About 1,000 areas in 47 States participated in a program for local definition of ED's, and in many of these areas, 1980 ED's have been defined to be compatible with their 1970 counterparts to the extent possible under the new guidelines. In other areas, 1970 comparability was not considered in defining 1980 ED's, for practical reasons.

Only in areas which had block groups in 1970 and in which census tract boundaries were not changed for 1980 is there a very good chance that 1980 and 1970 summary areas are comparable at the block group level.

Enumeration district data from the 1960 census (there were no block groups) and the maps needed to define them are, for practical purposes, no longer available.

Blocks

As was discussed previously, the scope of the block statistics program for 1980 represents a significant expansion over 1970—with the inclusion of places of 10,000 to 50,000 outside urbanized areas, and a substantial number of other areas for which block statistics were contracted.

Some blocks defined for 1970 will have new boundaries in 1980, primarily those on the edges of urbanized areas and other areas of new development where the street patterns have physically changed. Wherever a block has been redefined, by splitting or other adjustment, the 1970 block number will generally not be reused, so that the user might notice the change. In most areas, however, block boundaries and numbers will be the same in 1980 as in 1970, except for a few areas where blocks were renumbered by local GBF/DIME coordinating agencies to define more desirable block groups.

Block statistics first became available in the 1940 census, although the coverage was primarily limited to large cities. Only with the 1970 census was the program systematically extended to cover the fringe of urbanized areas.

Zip Code Areas

The availability of 5-digit ZIP code area data nationwide represents a significant expansion from 1970, when 5-digit ZIP code areas were summarized

Review

A review of the types of geographic units below the State level for which the Bureau will tabulate data. First, for counties that are part of a standard metropolitan statistical area (SMSA)—except in New England. Each SMSA is comprised of one or more counties. Each county within an SMSA is divided into census tracts, each tract having about 4,000 people. Each tract within the urbanized area portion of the SMSA is further subdivided into block groups.

The smallest geographic unit for which data will be tabulated is the individual census block. Block-level data will be available only for the urbanized area portion of the SMSA and any incorporated place of 10,000 or more population in the SMSA. Block data will not be available for the entire SMSA. Enumeration districts will be the smallest subdivisions in areas where census blocks do not exist.

only inside SMSA's. ZIP code areas are defined at the convenience of the U.S. Postal Service and it is assumed that a number of ignificant addition and boundary shifts have taken place since 1970. In the absence of definitive ZIP code area maps it is difficult to draw any conclusion about 1970-1980 comparability of any particular ZIP code area.

Use of Maps to Determine Area Comparability

No census geographic reference file will completely define area equivalencies from 1970 to 1980, nor, with the exception of tract comparability tables, will there be inventories of all the geographic areas that did not change their boundaries. Therefore, data users wishing to closely study decade-to-decade changes in places, enumeration districts, or blocks must plan on careful study and comparison of census metropolitan, place, and county maps from both the 1970 and 1980 censuses. Once done, however, such comparisons make possible inference of growth patterns and demographic changes by small area, which can add an important and interesting dimension to small area studies.

SUMMARY

The idea of the decennial census as a national inventory of related facts can be adequately implemented only by having statistical areas. This is especially important in the United States because of its large area, the great mobility of its population, and the fact that political boundaries in the United States offer comparatively little impediment to the flow of commerce and population across them. Because political boundaries have variable effect in shaping the spatial patterns of economic and population phenomena, they are inadequate for delineating the most meaningful areas for portraying and analyzing these phenomena. Ideally, the classification of economic and social activity should not have to follow even county or township lines; however, delineation of areas for census purposes must recognize and accomodate political entities to a certain extent.

The importance of statistical geography for potential users of the 1980 decennial census is highlighted by the fact that data will be tabulated fo 43,000 census tracts, 300,000 block groups and enumeration districts, and over 2.5 million blocks. In addition, governmental geography data will be tabulated for 3,136 counties, 20,000 legally incorporated villages, towns, and cities, and 35,000 minor civil divisions or census county divisions.

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Chapter 6

BASICS FOR DATA ANALYSIS

INTRODUCTION

Part II, thus far, has described the geographical areas for which census data are collected and published. For example, census information is collected and published by counties. This means Census Bureau documents can be obtained that list population data for every county in the United States. The volume of county level population data alone may appear imposing to someone not familiar with Bureau products. Yet many questions in addition to total population are asked and the data are collected and tabulated for a variety of geographic areas. The result is that the volume of data available for research and administrative purposes in both published and unpublished formats is truly astonishing. Compounding matters, the complex data collection and tabulation process itself creates important data use limitations and considerations. Obviously, some advice is needed before cansus data are used and analyzed. The purpose of this chapter then is to introduce several basic definitions, concepts, and procedures that are critical for intelligent data analysis.

The chapter organization emphasizes topics from the standpoint of a census data user. This individual may be a market analyst for a private firm selecting new sites for store locations, a social science student at a university collecting data to prove (or disprove) a theory, or a government planner compiling data to decide which communities are eligible to receive a housing development grant. All of these people consider census data a useful information resource for their research or decisionmaking process. To use this information source accurately, they need to be aware of how data collection and tabulation procedures affect the resulting information they are using. They need to (1) understand the type of information source the census is; (2) know the types of descriptive statistics used by the census; and (3) be aware of sampling and nonsampling errors when using census data. Each of these topics is discussed in this chapter while several suggested steps for properly using census data are presented.

THE CENSUS AS AN INFORMATION SOURCE

Many users regard the decennial census as an invaluable source of information on population and housing for this country. Of course, it is only one of many sources utilized by researchers and analysts. For example, a market analyst may want information on population and income as well as traffic counts, zoning restrictions, growth trends, and labor availability before selecting a particular site for a store. Data for this decision can be obtained through original investigation or from other published data sources. Because of the expense of original investigation, most analysts rely on published data.

Even published data can be difficult and expensive to obtain and organize when compiling facts from multiple sources. In the above example, although the market research analyst could obtain demographic (age, sex, and race) and labor availability (total number of persons employed in similar industries) data from the decennial census, the remaining information would have to come from State and local government sources (e.g., the planning commission in the jurisdiction where the stores are to be located). Contacts must be made with a number of governmental organizations if stores are to be located across the country. Data, where available, would be obtained in a variety of tabular formats and with contradictory definitions (e.g., zone 2C might be light commercial zoning in one city and heavy commercial in another). In contrast, census data provide national coverage from one source (the Bureau of the Census) and in a consistent format so that it is comparable, quickly available, relatively inexpensive, and fairly consistent from decennial census to decennial census.

As a result most market analysts start with Census Bureau products, usually the census of population and housing, for demographic information. Often other censuses are also found to be valuable (e.g., the economic censuses).

Primary and secondary sources of published (or released) data are used by market analysts. A primary source refers to the organization that originally collects and publishes the data. In addition to the Bureau, other well known organizations collect and publish data. For example, the American Institute for Public Opinion Research provides the Gallup Poll (frequently referred to by television newscasters for Presidential ratings) and the A. C. Neilson Co. provides the Neilson Survey (for television network ratings).

A number of organizations collect data from primary sources, reorganize the data, and then release them. This is termed a secondary source of information, an example of which is the Census Bureau's *Statistical Abstract of the United States.* (Reference 1, by Goeldner and Dirks, contains a comprehensive list of data sources.)

DESCRIPTIVE STATISTICS AND THE CENSUS

This section discusses how census data are summarized through the use of descriptive statistics. If you have had math or statistics courses you may be tempted to skip this section, but please don't. Many "sophisticated" analysts misuse census data because of their lack of understanding of Census Bureau concepts, procedures, and terminology—not necessarily statistics in general.

Census Language

Most individuals use descriptive statistics in their daily lives. For example, a baseball fan may refer to a team's "statistics." Just as it is impossible to talk about baseball statistics (e.g., RBI's, ERA's, fielding percentage) without understanding baseball and its language, it is impossible to talk about census statistics without understanding census language.

In fact, census language is very precise. Terms and concepts in daily popular use have specific meanings in Bureau publications. One example of a word used in everyday speech is family. What does this word mean to you? A person and all of his or her relatives? All persons living in the same house? When the Census Bureau uses "family" it means *all* persons who occupy a single housing unit and who are related to the householder (usually the person in whose name the home is owned or rented). Thus, in census

What You Don't Know About the Census Can Embarrass You or a Public Speaking Quiz

Dean Emeritus, a professor at the University of California at El Segundo (a major west coast football power) was asked to speak to the San Francisco Chamber of Commerce on bay-area commuting. In preparing his talk, Dr. Emeritus included a graphic from the 1970 census PC (2)-6D subject report: *Journey to Work* (see table 6-1). The graphic shows the number of people working in the San Francisco-Oakland SMSA and commuting to work by various means. His talk was well received by an enthusiastic audience of over 500 until his competitive colleagues, Prof. Paul Pedantic, pointed out an embarrassing fact.

Notice in the second column that there were a number of people living in the San Francisco-Oakland SMSA and working in various places across the country. The figures even seem to show 81 people commuting to Hawaii and 43 commuting to Vietnam by car!

Dean Emeritus hadn't noticed this little discrepancy before, and his mind raced as 500 pairs of eyes were riveted on him. The only sound in the room was that of his tenure flying out the window. By a quick response, however, he was able to extricate himself from this embarrassing situation.

What would you do? (1) Answer that "I don't know," (2) Excuse yourself to go to the rest room, (3) Pretend to faint. (Answer on the next page.)

Table 6-1. Illustration of Data Subject to Misinterpretation

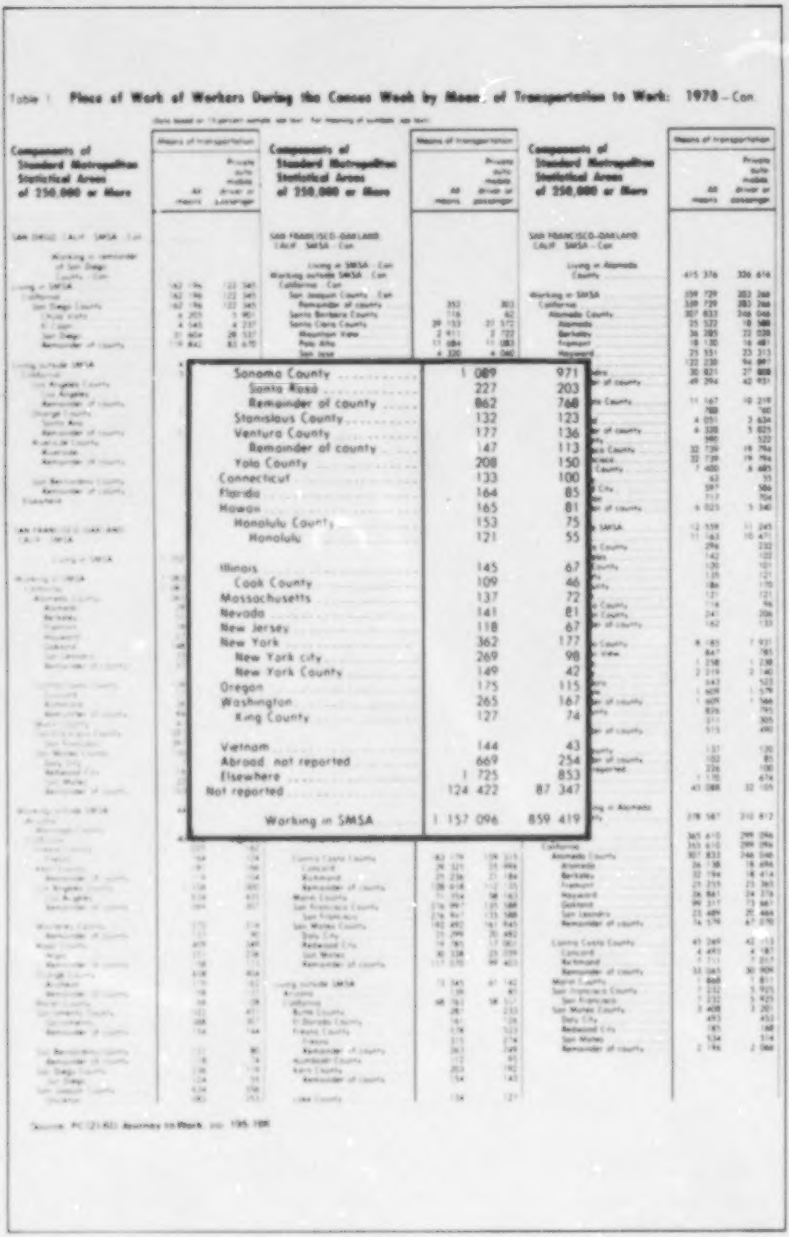


Table 1. Place of Work of Workers During the Census Week by Means of Transportation to Work: 1970—Con

Components of Standard Metropolitan Statistical Areas of 250,000 or More	Means of transportation: All means	Means of transportation: Private automobile driver or passenger
Sonoma County	1 089	971
Santa Rosa	227	203
Remainder of county	862	768
Stanislaus County	132	123
Ventura County	177	136
Remainder of county	147	113
Yolo County	208	150
Connecticut	133	100
Florida	164	85
Hawaii	165	81
Honolulu County	153	75
Honolulu	121	55
Illinois	145	67
Cook County	109	46
Massachusetts	137	72
Nevada	141	81
New Jersey	118	67
New York	362	177
New York city	269	98
New York County	149	42
Oregon	175	115
Washington	265	167
King County	127	74
Vietnam	144	43
Abroad, not reported	669	254
Elsewhere	1 725	853
Not reported	124 422	87 347
Working in SMSA	1 157 096	859 419

Source: PC(2)-6D, Journey to Work, pp. 195, 198

Answer to Quiz:

The correct answer is that these could be respondent errors, but it is more likely that these strange data can be explained by referring to the definition of terms or to the questionnaire. The question was worded "Where did you work last week?" People who moved from Vietnam right before the census day or were on a business trip in Vietnam the week before the census indicated they worked in Vietnam. Unfortunately, these responses do not indicate what one normally thinks of as commuting to work. A similar explanation applies to the eight people in Great Falls, Mont., reported as going to work by subway in the 1970 census.

Note: Straightforward definitions and explanations of census terms and concepts can be found in two places—in the *1980 Census Users' Guide* and in appendices to the major final published data reports. Then, of course, questions can also be answered by referring to the relevant part of the questionnaire. The *1980 Census Users' Guide* explains all sources of this information in greater detail.

terminology, a family excludes any relatives not living in the same household (e.g., a son or daughter away at college) and other persons living in the housing unit who are not related to the householder (e.g., fosterchildren, boarders). In addition, persons living alone are not counted as families.

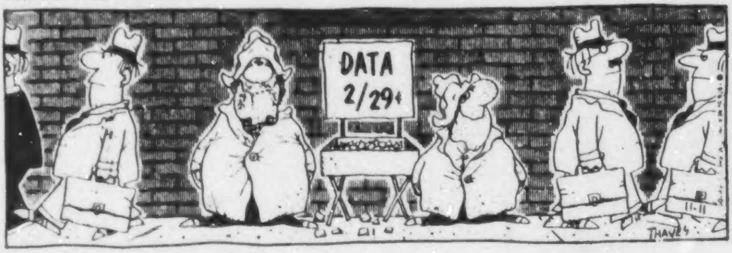
This discussion is important because mistakes are frequently made by users of census data who think they know what a term or data item means but have not checked the official definition. Common user errors include mistaking "family income" for "household income," misinterpreting the term "unemployed," or not knowing what kinds of buildings are considered as housing units. As a standard practice, Census Bureau publications always contain complete definitions for all concepts presented in the report. Most generally, these definitions are located in the appendix. Thus, it is important to check each term or concept before beginning data analysis.

"Describing" Census Data

Whether primary or secondary, the simple presentation or publication of collected data may not be satisfactory. This is particularly true in an evaluation or decisionmaking context where data in its raw form are too detailed to be helpful and thus have little, if any, information content for these purposes. As an example, if a friend asked you how the class did on a final exam, you could provide a complete list of the class scores or you could quickly summarize the class performance by calculating the *typical* (or average) class score and the *lowest* and *highest* scores. These three numbers (termed summary statistics) are computed measures used to concisely represent a large group of numerical values on the basis of a few measures.

The census provides valuable data for a variety of activities including marketing, administration, research, and planning. Raw data have little value, however, if they can not be easily assimilated for decisionmaking and research—the theme of the raw data cartoon. To be a true information source the census must be summarized by descriptive statistics that allow the data user to quickly understand and apply the information being presented.

FRANK AND ERNEST



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Raw Data v. Summary Data

In census terminology "raw data" is a term generally used to refer to data in its most basic form. In this context the term is used to refer to unaggregated records about specific individual respondents. "Raw" data from the census are of course confidential, but you may have seen raw data from other sources, such as a list of students and their test scores.

"Summary data" refers to the results of aggregating or summarizing raw data records. These results may be in the form of frequency counts, or descriptive statistics such as means, medians, percents, or ratios. In general, these figures summarize the characteristics of a specifically defined group of persons or other enumeration units. All published census data are summary data.

BASIC MEASURES

Professional data processors and statisticians have developed a wide range of descriptive statistics and processing techniques. However, there are several basic statistics that every census data user ought to be familiar with. They include: (1) Proportions and Percents; (2) Ratios; (3) Mean; and (4) Median.

It is beyond the scope of this chapter to provide a detailed definition of these statistics. However, the statistics textbooks referenced at the end of this chapter, and others that your instructor may suggest, provide excellent introductory material to help develop your statistical proficiency.

Proportions and Percents

A percent or a proportion is a simple descriptive statistic that would seem to need little explanation. However, this opinion illustrates exactly why census statistics are often misinterpreted. When using proportions or percentages from census publications, it is extremely important to know exactly what the numerator and denominator represent. For example, table 6-2 presents data on the "Gross Rent as a Percentage of Income." This means that family or primary individual income was divided into monthly gross rent multiplied by 12 for each renter-occupied housing unit, excluding one-family homes on 10 acres or more, group quarters, and vacant housing units. What a mouthful! But you can see how a "simple" percent in a Bureau publication may require some thought on the part of the data user.

You should also be aware of the denominator definition found in other percent statistics used by the Bureau. For example, most calculations of housing units exclude all group quarters and vacant housing units.

Ratios

Likewise, it is important in interpreting ratios to be absolutely certain as to what the numerator and denominator represent. For example, table 6-3 presents data on the percent of families classified by intervals of the ratio of family income to poverty level. It is important to know that this ratio is obtained for each family by dividing the income of that family by its corresponding poverty threshold. The poverty threshold used in this table is based on a poverty index adopted by a Federal interagency committee in 1969. For a nonfarm family of four, the poverty threshold was $3,743 that year (the poverty threshold for a nonfarm family of five would be larger than $3,743). Notice that the percentages are calculated by excluding inmates of institutions, members of the Armed Forces living in barracks, college students in dormitories, and unrelated individuals under 14 years old.

Means

With the mean, as with the percent, it is important to know the definitions of the data items being investigated. Mean income, for example, is an important census statistic. It is defined as the value obtained by dividing the total income of a census classification or data item by the number of units in that classification. Thus, the mean income for the classification "families" is obtained by dividing the total of all income reported by persons in families by the total number of families. Table 6-4 can be used to illustrate the concept. Look at the table, "Relationship to Head of

Table 6-2. Illustration of Percents

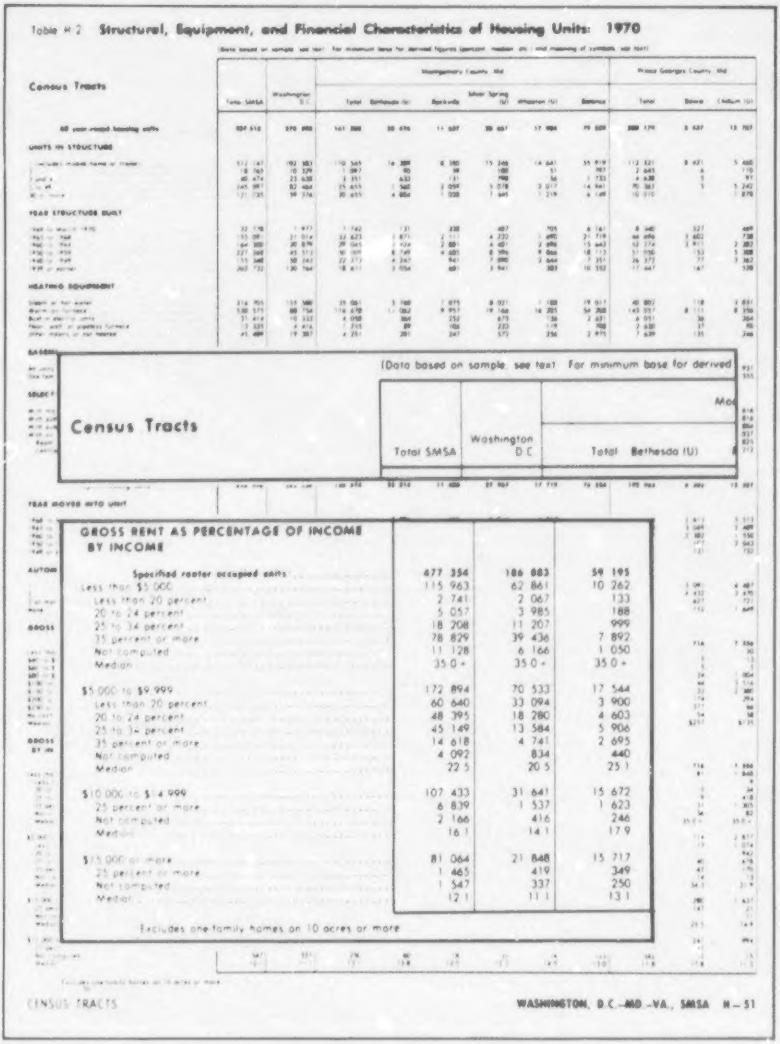

Table H-2 **Structural, Equipment, and Financial Characteristics of Housing Units: 1970**

(Data based on sample, see text. For minimum base for derived

Census Tracts

Total SMSA	Washington D C	Total	Bethesda (U)

GROSS RENT AS PERCENTAGE OF INCOME BY INCOME

Specified renter occupied units	477 354	186 883	59 195
Less than $5 000	115 963	62 861	10 262
Less than 20 percent	2 741	2 067	133
20 to 24 percent	5 057	3 985	188
25 to 34 percent	18 208	11 207	999
35 percent or more	78 829	39 436	7 892
Not computed	11 128	6 166	1 050
Median	35 0 +	35 0 +	35 0 +
$5 000 to $9 999	172 894	70 533	17 544
Less than 20 percent	60 640	33 094	3 900
20 to 24 percent	48 395	18 280	4 603
25 to 34 percent	45 149	13 584	5 906
35 percent or more	14 618	4 741	2 695
Not computed	4 092	834	440
Median	22 5	20 5	25 1
$10 000 to $14 999	107 433	31 641	15 672
25 percent or more	6 839	1 537	1 623
Not computed	2 166	416	246
Median	16 1	14 1	17 9
$15 000 or more	81 064	21 848	15 717
25 percent or more	1 465	419	349
Not computed	1 547	337	250
Median	12 1	11 1	13 1

Excludes one-family homes on 10 acres or more

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Household." The last line in this table "Persons per household" provides the mean number of persons per household. It is calculated by summing the number of persons in households and dividing this value by the total number of heads of households.

Table 6-3. Illustration of Ratios and Medians

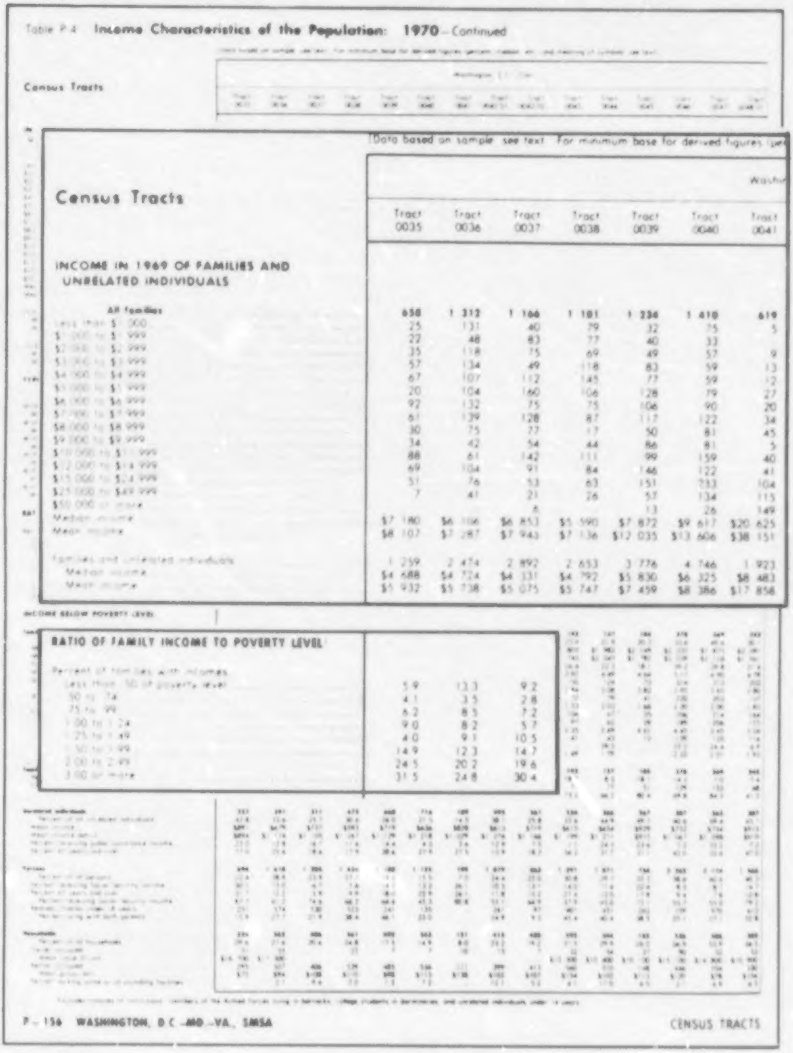

Table P-4 **Income Characteristics of the Population: 1970**—Continued

Census Tracts

[Data based on sample see text For minimum base for derived figures (pe

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Census Tracts	Tract 0035	Tract 0036	Tract 0037	Tract 0038	Tract 0039	Tract 0040	Tract 0041
INCOME IN 1969 OF FAMILIES AND UNRELATED INDIVIDUALS							
All families	**658**	**1 312**	**1 166**	**1 101**	**1 236**	**1 410**	**619**
Less than $1 000	25	131	40	79	32	75	5
$1 000 to $1 999	22	48	83	77	40	33	
$2 000 to $2 999	35	118	75	69	49	57	9
$3 000 to $3 999	57	134	49	118	83	59	13
$4 000 to $4 999	67	107	112	145	77	59	12
$5 000 to $5 999	20	104	160	106	128	79	27
$6 000 to $6 999	92	132	75	75	106	90	20
$7 000 to $7 999	61	139	128	87	117	122	34
$8 000 to $8 999	30	75	77	17	50	81	45
$9 000 to $9 999	34	42	54	44	86	81	5
$10 000 to $11 999	88	61	142	111	99	159	40
$12 000 to $14 999	69	104	91	84	146	122	41
$15 000 to $24 999	51	76	53	63	151	233	104
$25 000 to $49 999	7	41	21	26	57	134	115
$50 000 or more			8		13	26	149
Median income	$7 180	$6 106	$6 853	$5 590	$7 872	$9 617	$20 625
Mean income	$8 107	$7 287	$7 943	$7 136	$12 035	$13 606	$38 151
Families and unrelated individuals	1 259	2 474	2 892	2 653	3 776	4 746	1 923
Median income	$4 688	$4 724	$4 331	$4 792	$5 830	$6 325	$8 483
Mean income	$5 932	$5 738	$5 075	$5 747	$7 459	$8 386	$17 858

INCOME BELOW POVERTY LEVEL

RATIO OF FAMILY INCOME TO POVERTY LEVEL			
Percent of families with incomes			
Less than .50 of poverty level	5.9	13.3	9.2
.50 to .74	4.1	3.5	2.8
.75 to .99	6.2	8.5	7.2
1.00 to 1.24	9.0	8.2	5.7
1.25 to 1.49	4.0	9.1	10.5
1.50 to 1.99	14.9	12.3	14.7
2.00 to 2.99	24.5	20.2	19.6
3.00 or more	31.5	24.8	30.4

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The importance of proper choice of denominator in these definitions is illustrated in the difference between the concepts of mean income and per capita income. Mean income is usually defined for a particular classification, for instance, for persons 15 years old and over, and it

Table 6-4. Illustration of the Mean

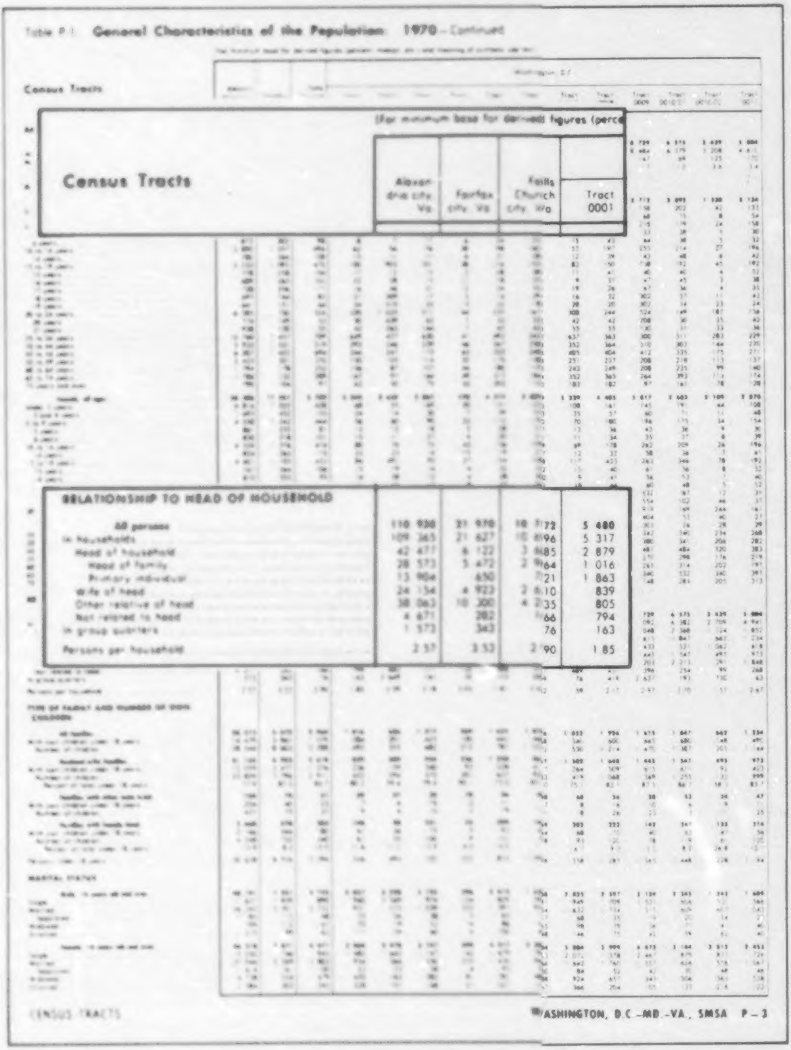

Table P-1. General Characteristics of the Population: 1970—Continued

Census Tracts	Alexandria city, Va.	Fairfax city, Va.	Falls Church city, Va.	Tract 0001
RELATIONSHIP TO HEAD OF HOUSEHOLD				
All persons	110 938	21 970	10 772	5 480
In households	109 365	21 627	10 696	5 317
Head of household	42 477	6 122	3 685	2 879
Head of family	28 573	5 472	2 964	1 016
Primary individual	13 904	650	721	1 863
Wife of head	24 154	4 923	2 610	839
Other relative of head	38 063	10 300	4 235	805
Not related to head	4 671	282	166	794
In group quarters	1 573	343	76	163
Persons per household	2.57	3.53	2.90	1.85

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represents the total income of persons 15 years old and over divided by the total number of persons in this category. Per capita income, by contrast, is defined as the total income of persons over 14 years of age (the census does not count income for persons under 15) divided by the total population of that area. It is always lower than the contrasting mean, since the total population includes persons not earning income such as children in families.

Finally, it is important to know that means for subpopulations or subareas can be combined to give a mean for a larger area. For example, the mean income for the seven individual census tracts in table 6-3 could easily be combined to give a mean income for the seven combined tracts. Although this procedure is not explained in this chapter, interested students are urged to review the weighted average section of most statistical textbooks.

Medians

While the mean is a useful descriptive statistic, reliance on the mean can frequently mislead the data user. The median, in contrast, nearly always is typical of the data values. For this reason, the Census Bureau calculates both the mean and the median for certain data items, such as family income (again, see table 6-3). Data for census tracts 39 and 41—located in Washington, D.C.—show a large disparity between mean and median income. Although both of these tracts have only a small proportion of families in the higher income levels, these families undoubtedly have large incomes, which makes the mean income larger than the income of most families in the tracts. In fact, the mean income for tract 39 is in a category greater than the income of 867 (or 70 percent) of the families. It may be desirable in these cases to use the median statistic because it is not influenced as much by a few extreme data values.

Given this characteristic of the mean, why does it have any value to users? Although there are several reasons, one of the most important is that the mean of one area can easily be combined with means from other areas to obtain a mean for a larger area. The median does not have this characteristic.

THE SAMPLING SIDE OF THE CENSUS

Because the census is known to be a complete enumeration of all the people and households in the United States on a census day, many people assume that each person in the country receives the same questionnaire. In actuality this is only partially true. Although certain basic questions are asked of every person, other questions are asked of only a portion of the population. This process of questioning only a portion of the total population is called sampling (or a sample survey) and the portion of the population questioned in this manner is called the sample population (or sample). The Bureau uses samples in both its census and survey programs for several reasons.

(1) Cost

Some legislators have expressed concern with the cost of conducting the decennial census. Other people are continually requesting even more

1980 CENSUS ITEMS COMPARED TO 1970

The sample percentages population and housing items included in the 1980 census in comparison with the items in the 1970 census are shown below. Please note that as new items have been added to the census questionnaire, others have had to be dropped. Thus, there are a number of items that were published in 1970 that were not included in 1980.

Population Items	1980	1970
Household relationship	100	100
Sex	100	100
"Race"	100	100
Age	100	100
Marital status	100	100
Spanish/Hispanic origin or descent	100	5
School enrollment	21	15
Educational attainment	21	20
Place of birth	21	20
Citizenship and year of immigration	21	5
Current language[1]	21	-
Ancestry[2]	21	-
Place of residence 5 years ago	21	15
Activity 5 years ago	21	20
Veteran status	21	15
Disability	21	5
Children ever born	21	20
Marital history	21	5
Employment status	21	20
Hours worked last week	21	20
Place of work	21	15
Travel time to work	21	-
Mode of transportation to work	21	15
Carpooling	21	
Year last worked	21	20
Industry, occupation, class of worker	21	20
Work and weeks looking for work previous year[3]	21	20
Income last year[4]	21	20
Birthplace of parents		15
Mother tongue	-	15
Vocational training		5
Industry, occupation, and class of worker 5 years ago		5

Housing Items	1980	1970
Coverage questions	100	100
Access to unit	100	100
Complete plumbing facilities	100	100
Number of rooms	100	100
Tenure (whether unit is owned or rented)	100	100
Condominium	100	-
Acerage and presence of commercial establishment	100	100
Value of home	100	100
Monthly rent	100	100
Occupancy and vacancy status	100	100
Description of building	21	20
Stories, elevator in structure	21	5
Acerage and crop sales	21	20
Source of water	21	15
Sewage disposal	21	15
Year built	21	20
Year present occupant moved into house	21	15
Heating equipment	21	20
Fuels	21	5
Cost of utilities and fuels	21	20
Complete kitchen facilities	21	100
Number of bedrooms	21	5
Number of bathrooms	21	15
Telephone	21	100
Air conditioning	21	15
Number of automobiles	21	-
Number of light trucks and vans	21	-
Basement	-	100
Clothes washing machine	-	5
Clothes dryer	-	5
Dishwasher	-	5
Home food freezer	-	5
Television	-	5
Radio	-	5
Second home	-	5

information that can only be collected by asking additional questions. Obviously, there is a potential conflict between the very real need for information, cost, coverage, and other matters already discussed in Chapter 3. If the total population were asked all of the census questionnaire items, the administration, collection, and processing costs would make the decennial census fiscally unacceptable to many taxpayers and legislators. Sampling allows the Census Bureau to collect the maximum amount of information within its budget capabilities.

(2) Quickness of Tabulation

Since the sample consists of only a part of the total population, the sample data can be processed and tabulated more quickly than the complete-count data.

(3) Correctness

Although it may seem odd, sample data are often more "correct" than complete-count data because it is easier to predict, estimate, and control errors in a sample. This point will be illustrated later in the chapter in a discussion of sampling and nonsampling error.

(4) Data Sensitivity and Respondent Burden

Certain questions that are rather sensitive in nature (e.g., income) are usually better handled if a sample is used, since fewer individuals need to respond to the question.

The use of a sample survey also reduces overall respondent burden (e.g., the time people spend filling out the questionnaire). For these reasons the census is structured so that certain key questions are asked of everyone while the remaining questions are only asked of a sample (table 6-4). The questions asked of everyone are termed complete-count questions and are distributed in "short forms" that look like a multiple-choice test. The sample "long form" questions are distributed only to a sample of the total population. Some of the questions on the long form will require handwritten answers. In most areas in 1980, one out of every six people will receive a long form. In addition, governmental units of less than 2,500 population (according to 1978 Census Bureau estimates of population) will be sampled at a 50-percent rate. This means a long form will be distributed to one out of two households in these areas. Overall, about one in five households will receive a long form.

Information collected through a sample of any population is subject to a certain amount of uncertainty or error. In statistical terminology the uncertainty due to the use of a sampling procedure is simply called sampling error. Sampling error results from the sampling process and does not pose serious problems for most users of census data, particularly if they only use data for large geographical areas. This is because the science of statistics has developed a variety of techniques for dealing with sampling error and uncertainty.

Census Sampling

The use of samples has been slowly introduced into the decennial census since 1940. At first it was not a proven or trusted means of information collection and was used on only "unimportant" questions. Gradually, as it has been refined and more widely accepted, the sample's role in the census has been expanded until today most decennial census questions are, in fact, sampled questions. In 1950 the use of sampling was significantly extended, but questions on important items such as labor force, occupation and industry, citizenship, and place of birth were retained on a complete-count basis. In 1960 nearly all restrictions on sampling were removed, and all questions except those required to define the population and those housing questions needed for blocks were asked as part of a sample. The same policy continues for 1980.

The Census and the Science of Uncertainty

Earlier in this chapter statistics was described as the collection and presentation of data. However, descriptive statistics are only one aspect of the statistical discipline. Statistics are also used to provide information for decisions in the face of uncertainty. This uncertainty may be due to our inability to guarantee the result of an action or the occurrence of a particular event, or even our inability to obtain or observe all necessary data.

What is the relationship between statistics and uncertain situations? The easiest way to understand this relationship is to talk about its basis, that is, probability. We encounter probability in everyday situations where our decisions involve an element of uncertainty or risk. Some examples are: The flipping of a coin to determine if it will land head or tails, a doctor experimenting with a new drug, an actuary determining life insurance premiums, a quality control engineer inspecting manufactured products, a teacher estimating the potential of different students, an economist forecasting business cycles, and a newspaper predicting an election.

Businesspersons encounter a probability situation when they determine the odds for the success of a new venture. They may feel that the odds for the success of a new fast food restaurant near a college are 3 to 2. This means that they would be willing to bet (or consider it fair to bet) $30 against $20, or perhaps $3,000 against $2,000, that the venture will succeed. In this way the businessperson expressed the strength of a belief regarding the uncertainties connected with the success of the new restaurant. Alternatively, we may say that an event has a probability of, say, 90 percent, in the same sense in which we might say that our car will start in cold weather about 90 percent of the time. This is the frequency concept of probability, which says that the probability of an event is interpreted as the proportion of the time that events of the same kind will happen in the long

Subjects in the 1980 Census Classified as Complete-Count or Sample Items

Population	Housing
Items collected at every household ("complete-count items")	
Household relationship[1]	Number of units at address
Sex	Complete plumbing facilities[1]
Race	Number of rooms
Age	Tenure (whether the unit is owned or rented)
Marital status	Condominium identification[1]
Spanish/Hispanic origin or descent[1]	Value of home (for owner-occupied units and condominiums)
	Rent (for renter-occupied units)
	Vacant for rent, for sale, and so forth; and period of vacancy
Additional items collected at sample households	
School enrollment	Type of unit
Educational attainment	Stories in building and presence of elevator
State or foreign country of birth	Year built
Citizenship and year of immigration	Year moved into this house[1]
Current language and English proficiency[2]	Acreage and crop sales
Ancestry[2]	Source of water
Place of residence 5 years ago	Sewage disposal
Activity 5 years ago	Heating equipment
Veteran status and period of service	Fuels used for house heating, water heating, and cooking
Presence of disability or handicap[1]	Costs of utilities and fuels[1]
Children ever born	Complete kitchen facilities
Marital history	Number of bedrooms
Employment status last week	Number of bathrooms
Hours worked last week	Telephone
Place of work	Air-conditioning
Travel time to work[2]	Number of automobiles
Means of transportation to work[1]	Number of light trucks and vans[2]
Persons in carpool[2]	Homeowner shelter costs for mortgage, real-estate taxes, and hazard insurance[2]
Year last worked	
Industry	
Occupation	
Class of worker	
Work in 1979 and weeks looking for work in 1979[2]	
Amount of income by source[1] and total income in 1979	
Derived variables (illustrative examples)	
Families	Persons per room ("crowding")
Family type and size	Household size
Poverty status	Plumbing facilities
Population density	Institutions and other group quarters
Size of place	Gross rent
	Farm residence

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[1] Changed relative to 1970.

[2] New items.

Federal Statistical Policy

The data collection system used by the Census Bureau must meet the policy standards set by the Office of Federal Statistical Policy and Standards as well as stringent Census Bureau regulations. The Census Bureau not only employs these strict standards with regard to the census but with regard to all surveys it conducts. The Federal standards establish criteria for defining the purpose of the survey, defining the relationship to others surveys or programs, and the development of the survey plan. The survey plan criteria include detailed specifications for selecting the target population (all the people, establishments or other units that the survey designer wants to learn about), sample design, method of collection, and error. The complete set of standards is published in the *Statistical Policy Handbook* published by the Office of Federal Statistical Policy and Standards.[1]

run. We cannot guarantee that the car will start on any one try, but would be willing to bet $9 against $1 (or 90 cents against a dime) that the car will start at a given try. We would expect to win $1 about 90 percent of the time and lose $9 about 10 percent of the time.

How then does the concept of probability translate an uncertain situation into information we can use? This is done through a somewhat paradoxical law of probability often termed the law of large numbers. This law can be used to predict with surprising precision the overall result of a large number of individual events, even though each of the events itself is unpredictable. In a sense, we can say that a large number of uncertainties produces a certainty. Although on the surface it may seem contradictory, this "paradoxical" law is an important tool to sciences such as physics and genetics, and to businesses such as insurance companies and opinion polls.

An example of this concept is radioactive decay. The half-life of thorium C is 60.5 minutes, and in that time exactly half of a sample of the radioactive material will disintegrate. The action of an individual atom cannot be predicted, but in the mass half of the sample disintergates in the predicted time. Another, more familiar, example is the insurance company's mortality tables in which the probability of a person's dying is calculated by age and sex. Although this table is virtually useless in predicting an individual person's death, it predicts with uncanny precision the number of deaths among thousands of persons. It is so accurate that insurance companies use it as a basis for life insurance premium rates. Statisticians use these concepts in sample surveys. If the sample is drawn in a prescribed probabilistic fashion so that it is representative of the total population, then it is possible to infer characteristics of the total population with information from the sample alone.

For example, what would be the most cost-effective way for the marketing research department of a large corporation to determine the public's

The Origin of Probability Theory

The origin of probability theory dates back to the 17th century. It seems that the Chevalier de Mere, an ardent gambler, was baffled by some questions concerning a game of chance—especially, he wanted to know how to divide the stakes of two players who fail to complete a game in which the winner has to win three matches out of five. He consulted the French mathematician Blaise Pascal (1623-1662), who in turn wrote about this matter to Pierre Fermat (1601-1665); it is this correspondence that is generally considered the origin of modern probability theory.

From Van Matre and Gilbreath, *Statistics for Business and Economics*.

attitude toward a new breakfast cereal product they plan to introduce. The company could introduce the product into a test market, e.g., Columbus, Ohio, to find out what Columbus' 1.5 million people think of the cereal before introducing it to other cities around the country. Should the company interview every person in metropolitan Columbus?

For the sake of argument let's say that the survey of Columbus can be processed for $5 per respondent. This would mean an expense of about $7.5 million to gain the information if every person is interviewed. Some people would consider this approach too expensive.

An alternative approach that may be employed by the company is to take a sample survey of the entire population at a sample rate of 0.1 percent, which would yield a sample of about 1,500 persons so that, for analysis purposes, each person sampled would represent 1,000 others. This sample survey would cost $7,500, a thousand times less than the 100-percent survey.

Let's further assume that one question asked during the sample survey is, "Do you like this new cereal?" If 1,350 (or 90 percent) of all persons sampled answered "yes," then the company would infer that 1,350,000 (90 percent) persons in the metropolitan Columbus market area would answer "yes" to this question. The same type of reasoning would apply to the "no" answers.

If the company took a complete enumeration of all people in Columbus, there would not be exactly 1,350,000 "yes's" and 150,000 "no's." However, the actual values would "probably" be very close. They would expect a smaller range of uncertainty if we took a larger sample, say at a 1-percent rate (15,000-person sample).

This approach, incidentally, is exactly how surveys and polls are conducted weekly by the Neilson and Gallup organizations. Additionally, they will probably use census data to ensure that their sample is demographically representative and that no large segment of the population (e.g., blacks, Hispanics, Asian-Americans, American Indians, aged, college graduates) are overrepresented or underrepresented in the sample. This means that the sample is not biased toward one or another population.

The devastating effect of biased sampling was mentioned in chapter 1 in the discussion of the *Literary Digest* incident in 1936. In that example the sample was overrepresented by people who owned telephones or who belonged to clubs and associations. Persons who did not have a telephone or a specific membership were underrepresented. In 1936 a substantial portion of the American population, millions of people, were in the latter group.

Given the serious consequences of incorrect sampling procedures, the Census Bureau has paid particular attention to this aspect of the census. In fact, the Bureau has played a significant role in the extension of the theory of sample surveys over the last 30 years, not only by making substantial contributions to the theory but by seizing the newest developments and applying them.

The point of this discussion is that sampling provides the Census Bureau with an economical means for handling a large number of complex questions. The sampling approach introduces some uncertainty, but this is acceptable to data users within the context of modern probability and statistics.

One reason uncertainty is acceptable is that the science of statistics provides some effective measurement tools. For example, if an estimate is calculated for a particular sampled census variable, then it is also possible to calculate a range in which the estimate lies by using a prescribed probability. That is, an upper and lower value can be calculated for the variable "centered" on the estimate. The size of this range, which is called the confidence interval, indicates the uncertainty associated with the estimate.

Calculating Uncertainty—Sampling Variability/Error

Numbers derived from sample data are only estimates of what a complete count would have shown. Stated another way, the data contain some amount of uncertainty or chance error and thus are subject to what is called "sampling variability." The magnitude of the likely error or uncertainty is rather small when large numbers are involved, but can be relatively large for smaller numbers. Suppose, for example, that 10-percent of the families in a given area are below the poverty level. If the area contained several million population, that figure would be expected to vary no more than a tenth of a percentage point. However, a comparable figure for a census tract of a

Table 6-5. Confidence Intervals for Estimates at Different Levels

Occupation (Figures based on 20-percent sample)	Fairfax County, Va. 1970 Census Estimate (1)	Fairfax County, Va. 95% Confidence interval[1] (2)	Percent Relative Error (3)[2]	Tract 4049, Fairfax Co. 1970 Census Estimate (4)	Tract 4049, Fairfax Co. 95% Confidence interval[1] (5)	Percent Relative Error[2] (6)
Total employed, 16 years old and over	163,556	162,456 - 164,656	0.7	749	634 - 864	15.4
Professional, technical & kindred workers	48,826	47,926 - 49,726	1.8	256	191 - 321	25.4
Managers & administrators, except farm	22,928	22,258 - 23,598	2.9	107	62 - 152	42.1
Sales workers	13,195	12,695 - 13,695	3.8	78	38 - 118	51.3
Clerical & kindred workers	38,121	37,341 - 38,901	2.1	194	134 - 254	30.9
Craftsmen, foremen & kindred workers	15,841	15,311 - 16,371	3.4	55	20 - 90	63.6
Operatives, except transport	4,454	4,164 - 4,744	6.5	6	([3])	
Transport equipment operatives	3,378	3,128 - 3,628	7.4	0	(NA)	
Laborers, except farm	2,885	2,655 - 3,115	8.0	16	([3])	
Farm workers	345	265 - 425	23.2	0	(NA)	
Service workers	12,088	11,608 - 12,568	4.0	37	7 - 67	81.1
Private household workers	1,495	1,325 - 1,665	11.4	0	(NA)	

NA Not available

[1] Takes account of sampling variability; range has 95 percent probability of including the value being estimated.

[2] Defined for this purpose as two standard errors as a percentage of the estimate.

[3] Indicates the relative error exceeds 100 percent.

Source: PHC (1)-226 *Census Tracts*, Washington, D.C.-Md-Va SMSA few thousand people could be expected to range between 6 and 14 percent. Thus, relative error is frequently more important to the data user than absolute error.

A statistic called the standard error allows one to estimate how much uncertainty or chance to allow for in a particular census variable. For areas of equal population size, the larger the standard error, the greater the uncertainty. Tables that can be used to calculate standard errors for particular census variables will appear in almost any census report based on sample data. The details on the location and use of the tables for calculating standard error are provided in the Appendix.

The standard error is a statistic that has a particular meaning to statisticians. To understand it, let us assume that we have the luxury of repeating our survey many times, each time calculating the estimate of some census variable based on the sample. Although we would get a different value for this statistic each time, statisticians assure us that a particular pattern will form. The law of large numbers, explained under the probability discussion earlier, specifies that the estimates would be clustered about the numbers that we would get from a corresponding complete count.

Statisticians also suggest that about half of the estimates are smaller than the complete-count value and about half of them are larger. Small errors (estimates close to the complete-count value) happen more often than large errors. About two-thirds of the time, the estimate will be within one standard error of the complete-count value. The chances are also about 19 out of 20 that the estimate will be off by less than twice the standard error and about 99 out of 100 that the difference is less than 2 1/2 times the standard error.

One caveat is important. In these statements we are comparing the estimate to a corresponding complete count rather than to the "true value." Sample estimates can be affected by errors in processing, biases in responses, and other forms of nonsampling error in the same ways that complete counts are affected. Calculations regarding sampling errors do not allow for most aspects of nonsampling error.

HOW SAMPLING AFFECTS DATA USE

The point that a significant portion of the census data comes from a population sample and that the remainder comes from a complete count of the population has a number of important implications for the data user. These include apparent discrepancies among data sources, the calculation of statistics, and the selection of the most appropriate data source.

An Important Statistical Note

There are important differences between the sample conducted in the census and other sample surveys, for example Presidential polls. Remember that the census is a statement about an entire population or universe so that the use of inferential statistics to determine significant differences (e.g., T-test or analysis of variance) is inappropriatae with complete-count variables. Even the sample conducted in the census is so large as to make any difference observed at the National level or other large area statistically significant. The user should be aware, however, that observable differences for small areas may be due to sampling error. Statistical significance in this context should not be confused with conceptual significance (or importance).

Discrepancies Between Sample and Complete-Count Data

As discussed previously, most areas of the country are to be covered by a one-household-in-every-six sampling plan. When tabulations are prepared from these sample data, each sample person or household will be counted as representing six persons or households on the average. In cities, towns, or townships with less than 2,500 population (based on 1978 estimates), the sampling rate will be one household in every two, and in those areas each sample person or household will be counted as representing two (e.g., each household will have a sample weight of two on the average). All of the resulting data will, of course, be estimates rather than complete census counts.

The process of assigning weights to sample persons or housing units is actually more sophisticated than just using six or two as sample weights in appropriate areas. In a complicated procedure designed to minimize sampling variability, weights are derived from the precise ratio of complete-count cases to sample cases within particular areas and particular population subgroups. A more detailed explanation of this process is contained in the *1980 Census Users' Guide.*[1] A by-product of this process is that complete counts and sample population and housing counts usually match exactly for the geographic areas used in the process, which are called "sample weighting areas."

Population and housing counts in complete-count versus sample reports do not coincide precisely whenever the geographic area in question does not happen to equal a sample weighting area or a combination of complete sample weighting areas. Sample weighting areas are mutually exclusive units observing county, place, census tract, and minor civil division (for 20 northern States) boundaries provided that each area has at least 2,400 inhabitants (800 in 50-percent sample areas). Where, for example, a tract has less than 2,400 population, it is lumped together with the next census

Table 6-6. Population Discrepancies for Counties: Complete Count Versus Sample

(Population counts from selected printed reports series for Colorado, 1970 Census of Population and Housing)

	Complete-count data	Data based on sample:	
Counties	Table 9, PC(1)-A, Number of Inhabitants	Table 43, PC(1)-C, General Social and Economic Characteristics	Table 60, HC(1)-B, Detailed Housing Characteristics
Conejos	7,846	7,846	7,846
Costilla	3,091	3,091	3,091
Crowley	3,086	3,086	3,086
Custer	1,120	1,002	1,074
Delta	15,286	15,404	15,332
Denver	514,678	514,678	514,678
Dolores	1,641	1,593	1,632
Douglas	8,407	8,455	8,416
Eagle	7,498	7,498	7,498
Elbert	3,903	3,903	3,903

tract to makeup a sample weighting area, with the result that complete-count and sample totals will not match exactly for either tract but should match if the user added the two together. Population data and housing data are weighted according to corresponding but independent schemes. Thus, population data in a sample housing report may disagree slightly with corresponding data in a sample population report, as illustrated in table 6-6.

The point of this discussion is that, while estimates from samples need not exactly equal the complete count (they frequently do), the user may be caught off guard when they do not. Such discrepancies are especially likely to be noticed in census tract reports where, for example, one table is produced from complete-count data and another table is developed from sample data; however, both tables list the total population at the top.

These discrepancies are illustrated in tables 6-6 and 6-7. Notice that the discrepancies only occur in counties less than 2,500 population and the counties listed next to them in the table. This resulted, because in 1970, county boundaries are always respected in defining weighting areas. This is not true in table 6-7, since in 1970, MCD's were usually ignored in the sample weighting process and hence differences more nearly reflect sampling variability, as discussed earlier.

Table 6-7. Population Discrepancies Between Complete-Count and Sample Data for MDC's/CCD's

MCD's/CCD's	Complete-Count Data Table 10 (Green County, N.Y.) PC(1) A31	Sample Estimate Table 3 Fifth-Count Microfilm
Ashland town	397	485
Cairo town	3,546	3,448
Catskill town	10,432	10,446
Durham town	1,651	1,709
Greenville town	2,279	2,114
Halcott town	199	114
Hunter town	1,742	1,728
Jewett town	442	473
Lexington town	662	690
New Baltimore town	2,068	2,233
Prattsville town	721	771
Windham town	1,190	1,132

The sample weighting process works to minimize differences between complete counts and sample estimates for certain basic age, race, sex, relationship, tenure, and household-size categories. Complete-count data, however, usually will not agree exactly with the same data produced from a sample

Calculating Means, Ratios, and Percents

The difference between complete-count and sample variables is particularly important when calculating statistics such as means, ratios, and percents. For example, in determining the percentage of 16- to 21-year-olds who are not high school graduates, the base figure for ages 16 to 21 would preferably be taken from the same source as the numerator. In effect, using numerators and denominators from the same table reduces some of the impact of sampling variability and avoids producing "strange" results such as the possibility of deriving a proportion larger than 100 percent.

Using the "Right" Data Source

The point that some data items are released as both sample and complete-count items makes it extremely important that the user select the source of information most appropriate for the particular application.

For example, suppose day care centers were being planned for a particular area and the plans call for a center for every 50 children. This value is small

The Census and Confidentiality

We have discussed in other places the confidential aspects of the census. The confidentiality standards employed by the Census Bureau affect the data user from the standpoint that certain data items are not released (printed) if minimum population requirements are not met. For example, if family income were printed for an area with only two families, then either family could learn the other's income. Consequently, data for such an area would be suppressed or not released. Details on suppression rules are printed in the *1980 Census Users' Guide*.

enough that very little uncertainty can be tolerated. In this application the user should use a complete-count source.

NONSAMPLING ERRORS

"Anything that can go wrong, will"—Murphy

In addition to the sampling error or variability discussed above, another form of uncertainty exists in census data and the sources of the error are many. Despite the best planning and organization, a number of nonsampling errors occur in any census, including: (1) Problems of questionnaire design; (2) response rates; (3) enumerator techniques; (4) coding errors; and (5) undercounting. In contrast to the acceptable (and planned for) sampling error, these nonsampling errors are undesirable and the Census Bureau would like to eliminate them entirely from the census. We shall briefly discuss some of the major types of nonsampling errors.

Questionnaire Design

The Census Bureau is accepted as one of the world's foremost authorities on questionnaire design, since its questionnaires must be subjected to such stringent requirements. The questions have to be easily understood (and the answers easily recorded) by most citizens. All questions have to be phrased so they are not offensive to even the most sensitive citizen. The visibility and official nature of the census make this last requirement particularly important. In addition, the questionnaires must be designed to be efficiently mailed and easily handled in bulk.

Despite careful planning by the Census Bureau (including pretests and dress rehearsals) errors due to questionnaire design still occur. The most significant of these in 1970 involved a problem in recording the respondent's age. A substantial number of respondents erroneously checked the first box for decade of birth thus indicating birth in the 1860's rather than the 1960's. The result was that many people were incorrectly recorded as being over 100 years old. Corrected figures were subsequently prepared and released by the Census Bureau. The age question for the 1980 census has been redesigned to avoid this problem.

Response

A number of errors occur in the census because of inaccurate responses. Some inaccurate responses are a result of confusion because of questionnaire design, as noted above. Others, however, are a result of intentional fictitious answers on the part of the respondent. Unfortunately, some people still believe the census is used by the Government to "check up on people" (particularly with regard to income) and that census information is shared among Federal agencies. Some questions are even left blank by respondents.

It is hard to determine how many answers are fictitious, but they seem to be small in number. The Census Bureau does catch some of them in the editing process. Occasionally, the answer can be corrected based upon other answers provided by the respondent. If not, data are allocated from the last respondent who answered the question and had similar demographic characteristics. This process, which is also used if the respondent left the question blank, is called allocation. A similar process is used to substitute entire questionnaires when they have been lost or accidentally destroyed.

Enumerator Techniques

In the earlier censuses, Federal marshals were used as enumerators. One can imagine the enthusiasm with which this task was undertaken, given the primary activities for which the lawmen were famous. In many cases it is suspected that census information was fabricated by the enumerator who would not travel to remote areas of the country for purposes as "mundane" as the census. Although the marshals no longer collect census data and contemporary enumerators are employed who are much better trained and better supervised, there are still occasional problems with enumerator techniques.

Modern enumerators have sometimes been guilty of fabricating data. This may happen in areas or dwellings that enumerators are afraid (or too lazy) to enter. For example, a house may be so dilapidated that the enumerator assumes no one could possibly live there, so he/she completes the form for that address while sitting on the curb, a practice that has come to be known as "curbstoning."

Coding Errors

Some census errors occur when the data are incorrectly translated from the returned questionnaire into a form which can be used by the computer. This is especially a problem when a written answer (as opposed to a checked box) is converted into numeric code, as in the case of occupation.

For example, the editing process in 1970 uncovered an interesting phenomenon in Philadelphia. It appeared that a large number of females under 21 years old were Philadelphia taxi drivers. This was certainly peculiar in light of the fact that taxi drivers are required by Pennsylvania law to be over 21. On checking the questionnaires as returned, the problem was discovered. Some "ladies of the evening" had written their occupation as "taxi dancer," which was misinterpreted as "taxi driver" by Census Bureau staff.

Allocation and Substitution Tables

All of these problems can lead to omissions or obvious inconsistencies in the data, some of which may not be caught (or followed up) at data collection time. As many of these errors as possible will be corrected during computer processing of the data. Effective procedures have been developed to edit the data by computer and to make reasonable allocations for missing or inconsistent data. (An example of this process was described earlier under "response errors.") The census user should know that allocation rates for subjects in a variety of geographical areas are given in tables in a number of publications (see the *1980 Census Users' Guide*). If these tables show an unusually large allocation rate for a particular subject in a particular area, the data should be used with caution.

We also discussed the substitution of entire questions. A substitution occurs where a person or household is known to be present but for which there is no information. In this case, data from a previously processed household are selected as a substitute and the full set of characteristics for each person is duplicated. The necessity for a substitution can arise from either a "noninterview" or a mechanical failure. Tables presenting the number of persons for whom data were substituted in a variety of geographical areas are referenced in the *1980 Census Users' Guide*.[3] The user of small area data (especially blocks and enumeration districts) should check the tables to ensure that he or she is not working with an unacceptable level of substituted data.

Undercount

Another type of error cannot be handled by substitution or allocation. This is the undercount error, which was discussed in chapter 3. The undercount error differs from the other types of errors in that it is difficult to correct with the use of allocation or substitution procedures. Remember that in allocation or substitution, the census is aware of the existence of an occupied housing unit and is supplying data for it. However, in the case of an undercount, the Census Bureau is unaware of the existence of a housing unit or person.

There are a number of reasons why people don't make themselves available on census day. As was pointed out in chapter 3, the major villain is apathy, although suspicion and fear of the Government are also problems, as are the logistical problems due to the general mobility of our society.

There are ways in which the Census Bureau can determine the extent and characteristics of the undercount, for example, the Bureau has access to reliable birth rate, death rate, and migration data (legal migration only) recorded since 1935. From these sources, the Census Bureau can construct an independent estimate of the "true population" for the population aged 0 through 44 (1979-1935 = 44). Unfortunately, this can only be estimated for the Nation and large regions of the country. Therefore, information on the undercount is only available at this gross level. Thus, the undercount for cities, counties, and census tracts cannot reliably be determined.

In 1970, using this type of data, the actual population and henee the undercount was determined for the Nation. The overall undercount in 1970 was about 5,301,000, which was 2.5 percent of the total population. This varied greatly, however, for different subpopulations in 1970. The undercount for the black population was higher than for the white population. Reliable undercount statistics are not available for other ethnic groups, although available evidence indicates that in the Spanish-American population, the undercount may have been even higher. Also, the undercount varies by region.

Evaluation and Research Program

Along with each census the Census Bureau conducts a number of studies of nonsampling errors in a formal Evaluation and Research Program covering the accuracy of selected subject matter (response errors) and the effectiveness of the enumeration process (coverage errors). The studies will be published in the evaluation and research program report series (reference 4 of this chapter) and will discuss: underenumeration of blacks relative to underenumeration of whites; clerical errors in coding write-in responses for items like residence 5 years ago and occupation; and respondent errors, as measured by reinterviews, on such subjects as disability status and homeowner shelter costs. These studies will provide estimates of error at the National level. Unfortunately, this information can be only approximately applied to statistics for small areas, and these studies do not yield "correct" figures to substitute for those published in data reports.

Nonsampling Errors in Perspective

The point to be made about nonsampling error is that the sophisticated data user should be aware of the quality of the data and the potential limitations of their use. Census Bureau data, unlike many data sets, are unique in that their reliability and validity are so well studied and their error rates are published.

SUMMARY

When using the census as a statistical data source there are a number of major points to remember:

Be sure of your census terms and statistics. In determining which census variable or statistic to use, be certain that the concepts and variables are what you think they are. For example, is the income variable you plan to use defined as family income or household income? Are averages, percents, and other statistics calculated in the way that you think? These answers can often be found in the appendix of the printed report in which the data appear. (An illustration of the standard error calculation procedure is located in the Appendix of this chapter.) The original questionnaire may need to be examined to understand the interpretation provided by the respondent.

Know whether the data come from a complete count or sample. If the population in question is small, sample estimates may not be sufficiently reliable for a particular planning purpose. Whenever there is a choice, use data based on a complete count rather than sampled data. In addition, apples and oranges should not be mixed. For example, when calculating a mean, check to see that the numerator and denominator refer to the same classification of the population (e.g., all housing units, or all occupied housing units).

Be aware of sampling variability, substitution, and allocation. If sample data are used, calculate the standard error by using the procedures described in the census publications. Also check to see that there are not a large number of substitutions or allocations in an area—particularly if it is a small area where substitution and allocation may give undesirable results. The *1980 Census Users' Guide* references the location of substitution and allocation tables for any area in question.

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APPENDIX

CALCULATING STANDARD ERRORS AND CONFIDENCE INTERVALS

For many applications of Census data, the user has to be concerned with the degree of uncertainty or size of the error associated with a particular census variable. This is particularly the case for small geographic areas with small populations where the size of error can be large relative to the population total. If the application is dependent upon precise measurement of the population, then large sampling error can be a consideration and the user should calculate standard errors and confidence intervals.

This process is described in the *1980 Census Users' Guide*. Standard errors for census sample data can be approximated by using a few simple steps with tables published in the back of reports containing sample data. (Tables 6-8, 6-9, and 6-10 are from a 1970 census report; actual 1980 tables may differ slightly in format, to take into account the two sample sizes.) The following steps should be taken to calculate the standard error and its associated confidence interval.

(a)Look up the approximate standard error in table 6-8 for numbers or table 6-9 for percentages. Interpolate if necessary.

(b)Find the applicable factor in table 6-10. (If more than one factor is applicable, use the largest.)

(c)Multiply the factor times the approximate standard error (that gives you your estimate of the standard error).

(d)Double the estimated standard error and add and subtract that figure from the original estimate, to determine a 95-percent confidence interval.

Example—Assume you have found, in a table of a tract report, that there are 247 married women in the labor force in tract 18.01.

(a)From table 6-8, the approximate standard error for 250 is 30.

Table 6-8. Approximate Standard Error of Estimated Number Based on 20-Percent Sample

(Range of 2 changes out of 3)

Estimated number (persons or housing units)	Standard error	Estimated number (persons or housing units)	Standard error
50	15	1,000	60
100	20	2,500	85
250	30	5,000	100
500	45	(For larger figures use tables in PC(1) or HC(1) reports or formula (1) on page 88)	

Source: PHC(1), appendix C.

Table 6-9. Approximate Standard Error of Estimated Percentage Based on 20-Percent Sample

(Range of 2 chances out of 3)

	Base of percentage (persons or housing units)					
Estimated percentage	500	1,000	2,500	5,000	10,000	15,000
2 or 98	1.3	0.9	0.6	0.4	0.3	0.2
5 or 95	2.0	1.4	0.9	0.6	0.4	0.4
10 or 90	2.7	1.9	1.2	0.8	0.6	0.5
25 or 75	3.9	2.7	1.7	1.2	0.9	0.7
50	4.5	3.2	2.0	1.4	1.0	0.8

Source: PHC(1), appendix C.

(b) The factor for Employment Status is 0.8. (Since no factors are given for marital status and sex we can only assume they don't affect this calculation.)

(c) 30 x 0.8 = 24 is the estimated standard error for 247 married women in the labor force.

(d) 2 x 24 = 48. 247 - 48 to 247 + 48 (199 to 295) is the 95-percent confidence interval.

Thus we can say that the odds are 19 out of 20 that the interval (199 to 295) contains the number of married women in the labor force in tract 18.01.

Table 6-10. Factor to be Applied to Standard Errors

[Subjects marked with an asterisk were tabulated on a 100% basis for tables P-1, H-1, and H-3. Standard errors are not applicable to these tables]

Population subjects[1]	Sample rate (percent)	Factor	Housing subjects[1]	Sample rate (percent)	Factor
*Race	20	1.6	*Tenure	20	0.2
*Age	20	0.8	*Rooms	20	1.0
*Household relationship	20	0.5	*Persons per room	20	0.4
*Family composition	20	0.6	*Value	20	1.0
Country of origin (including Spanish heritage subjects)	15	1.6	Units in structure	20	0.8
Nativity and parentage	15	1.7	Year structure built	20	0.9
School enrollment	15	1.0	Heating equipment	20	0.8
Years of school completed	20	1.0	Basement	20	0.9
Residence in 1965	15	2.0	Source of water	15	1.0
Employment status	20	0.8	Sewage disposal	15	1.0
Place of work	15	1.3	Air conditioning	15	1.1
Means of transportation to work	15	1.3	Year moved into unit	15	1.1
Occupation	20	1.1	Gross rent	20	0.9
Industry	20	1.1	All other—20 percent	20	1.0
Class of worker	20	1.1	—15 percent	15	1.2
Income—persons	20	1.0			
—families	20	1.0			
Poverty status—persons	20	1.9			
—families	20	1.0			
All other—20 percent	20	1.0			
15 percent	15	1.2			

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[1] Tabulations of data for persons of Spanish heritage are based on the 15-percent sample. For subjects shown in this table as based on the 20-percent sample, the factor for persons of Spanish heritage is obtained by multiplying the appropriate factor in this table by 1.2. For subjects shown as based on the 15-percent sample, the factor in this table can be used directly.

Source: Census Tracts, PHC(1), appendix C.

Chapter 7

COMPONENTS OF THE POPULATION EQUATION

INTRODUCTION TO DEMOGRAPHY

Demography may be defined narrowly or broadly depending upon how its practitioners address the component terms of the population equation. In the most general sense, demography is the scientific study of human populations (their size, distribution, and composition) and the changes that occur in these phenomena through the processes of fertility (births), mortality (deaths), and migration. Demographers are concerned with how large or small populations are (their size), how the populations are composed according to age, sex, race, and other characteristics (their composition), and where the populations live and work (their distribution). Demographers are also concerned with changes over time in the size, composition, and distribution of populations, and how the processes of fertility, mortality, and migration bring about the changes. Together, the measures of population change are studied by demographers under the heading of the population equation.

Demographers are also concerned with the question of how these population phenomena operate and why populations behave the way they do. In other words, why do populations increase (or decrease) in numbers, why do they become older or younger, why do they become more urban or less rural? Some demographers go only so far as to employ strictly "demographic" variables to answer these questions, while others go further to include nondemographic concepts drawing frequently on history, sociology, economics, geography, and psychology.

The demographers who employ demographic variables follow a *formal* demographic approach in developing explanations, while those employing nondemographic variables use a *social* or *economic* demographic approach. An example may help to clarify the distinction among the approaches.

Take the question of why populations are distributed the way they are. We know that States differ with respect to the proportion of their residents who live in large cities. For example, in 1976 almost 80 percent of the population of Texas lived in metropolitan areas, while in Maine and South Dakota the proportions were 23 percent and 15 percent, respectively. Why do these differences exist? In an attempt to answer the question, the *social* demographer might supplement purely "demographic" measures by focusing on commercial innovation, corporate agriculture, and related types of sustenance-producing activities. The *formal* demographer, on the other hand, would rely solely on demographic variables in developing an explanation.

Let's take another example, that of population change. Between 1970 and 1977, the population of Texas increased by almost 15 percent while Maine increased by 9 percent and South Dakota by 11 percent. The State of New York lost nearly 2 percent of its 1970 population during the interval, and the District of Columbia lost nearly 9 percent of its 1970 population. Why have these government units been changing at such different rates? The formal demographer might develop an answer to this question by looking at the birth rates, death rates, and net migration for the States (a discussion of migration is presented later in this chapter). Texas, for example, increased by nearly 7 percent through net migration alone, while the corresponding figure for Maine was 5 percent. South Dakota, New York, and the District of Columbia, on the other hand, lost 2 percent, 5 percent, and 12 percent, respectively, of their 1970 populations through net migration. That is, these latter two States and the District lost more persons through migration between 1970 and 1977 than they gained through natural increase.

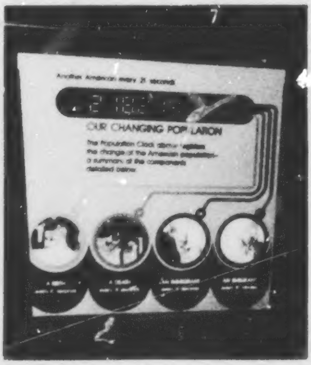
In answering the same question as to why these States grew at such different rates, the social demographer would perhaps look first at the migration rates, but then would go beyond this demographic consideration to the socioeconomic and other nondemographic factors affecting migration. The social demographer would ask what causes a State to have net inmigration or net outmigration. Perhaps the economy is changing or perhaps change in the quality of recreational facilities, living conditions, and climate are important factors. Whatever the answers (and there are many possible ones) the social demographer goes beyond demography (beyond a consideration involving only demographic variables such as migration rates) in formulating an answer to the question of why States grow at different rates.

Having distinguished the two basic approaches to the study of demography, the remainder of this chapter will introduce basic demographic methodology. The discussion will, in the main, be restricted to formal demography; that is, the focus will be on the various demographic factors noted above and their changes. How are populations increasing or decreasing in size? Where are they distributed in physical space, and what concepts and measures are used in the analysis of population distribution? We begin with a basic demographic research theme—population size.

POPULATION SIZE

Change in the size of a human population during a given time interval results from the influences of three components: Births, deaths, and net migration. That is, population change in size may be measured over a given interval by (1) adding the number of persons born during the period; (2) subtracting those dying during the interval; (3) adding the number of persons moving to the area; and (4) subtracting those moving away. There are no other ways for the total population of a fixed area to change its size (fig. 7-1).

How Many Americans ?



As of July, 1979 there was an average of:

One BIRTH every 9.480 seconds,
One DEATH every 16.596 seconds,
One IMMIGRANT every 74.086 seconds,
One EMIGRANT every 14.600 minutes,
and a NET GAIN of one person every 17.365 seconds.

How many births (B) should there be in a year?

How many deaths (D) should there be in a year?

How many immigrants (Im) should there be in a year?

How many emigrants (Em) should there be in a year?

$$\text{NET GAIN} = B - D + Im - Em$$

How many more Americans should there be at the end of the year than there were at the beginning?

What is the major source of the increase – the excess of births over deaths or the excess of immigrants over emigrants? By how much?

(ANSWERS ON NEXT PAGE)

Figure 7-1. POPULATION CHANGE IN THE UNITED STATES

How Many Americans ?

ANSWERS FROM PREVIOUS PAGE

60 seconds x 60 minutes x 24 hours x 365 days = 31,536,000 seconds/year

3,326,582 BIRTHS/year
1,900,217 DEATHS/year
425,567 IMMIGRANTS/year
36,000 EMIGRANTS/year

NET GAIN = 3,326,582 – 1,900,217 + 425,667 – 33,000 = 1,816,032

1,816,067 NET GAIN/year

NATURAL INCREASE (excess of births over deaths)	NET MIGRATION (excess of immigrants over emigrants)
3,326,582	425,667
–1,900,217	– 36,000
1,426,365 (78.5%)	389,667 (21.5%)

The above may be presented in a form of the fundamental population equation linking two populations at different dates and the components of change.

$$P_2 = P_1 + B - D \pm M$$

where

P_2 is the size of the population at the end of the time interval;
P_1 is the size of the population at the beginning of the interval;
B is the number of births occurring in the population during the interval;
D is the number of deaths occurring in the population during the interval; and
M is the net number of migrants moving to or away from the area during the interval.

Using data (expressed in thousands) for Texas and New York between 1970 and 1977, the respective population equations are as follows:

State	(P_2) 1977 Population	=	(P_1) 1970 Population	+	(B) 1970-1977 Births	–	(D) 1970-1977 Deaths	+	(M) 1970-1977 Net Migration
Texas	12,867		11,236		1,587		716		760
New York	17,950		18,268		1,850		1,295		–873

By examining the demographic components within each population equation, one obtains an appreciation of how these components collectively produce change in population size during a time interval. Texas grew between 1970 and 1977 because there were more than twice as many persons who entered the population by births than who left it because of deaths; and because 760,000 more persons entered the Texas population through inmigration than left it through outmigration. New York declined in size between 1970 and 1977 principally because 873,000 more persons left the State through outmigration. And this loss through net migration was not offset by a sufficiently large excess of births over deaths, since there were only 555,000 more births than deaths in New York. Had this excess of births been greater than the 873,000 lost through net outmigration, the population of the State of New York would have increased between 1970 and 1977.

Another way of examining population size and the population equation is through an analysis of the components of change for single years. Table 7-1 provides such information for the United States for the period 1970 to 1979. The table notes, for example, that between 1978 and 1979, the population of the United States grew by 1,745,000. This total growth was arrived at as follows: 3,328,000 persons were added to the population by births, 1,925,000 left the population through deaths, and there was a net of 343,000 migrants.

The major component contributing to the growth of the United States as a whole in the 1970's is the birth component; it is nearly 10 times as large each year as the net migration component (table 7-2).

If one considers population size by itself, fig. 7-2 illustrates how the population of our Nation grew each decade from the 1st census in 1790 to the 19th census in 1970. The size of the United States was less than four million at the time of the first census and grew by 1970 to more than 200 million. The most populous State in the United States in 1970 was California, with a population of nearly 20 million. New York, Pennsylvania, and Texas were 2nd, 3rd, and 4th. Alaska, with a population of 300,000 in 1970 (smaller than the population of the Austin, Tex. metropolitan area), was the smallest State in population.

We began in this section to discuss population size, the principal characteristic of a population. It was pointed out that a particularly useful strategy for examining population size and the manner whereby populations change in size is to apply the population equation both nationwide and in selected States. These observations about size prepare us for the consideration of the next area of demographic study, population distribution.

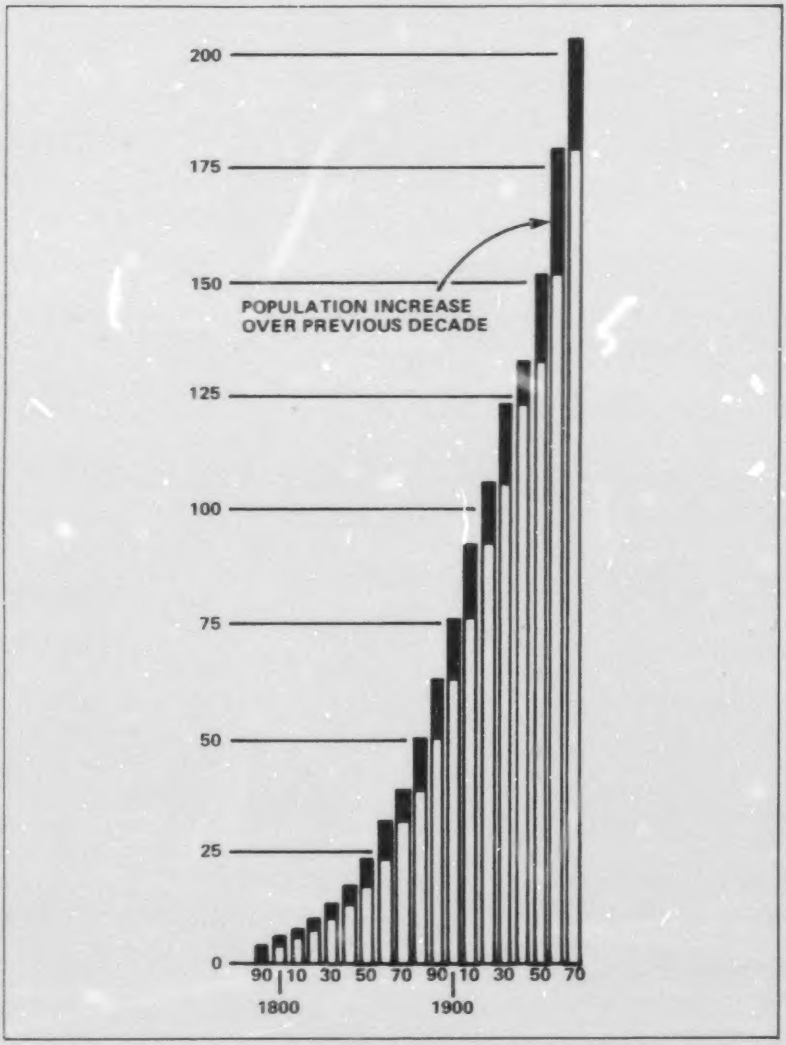


Figure 7-2. POPULATION INCREASE BY DECADE: UNITED STATES, 1790 TO 1970

POPULATION DISTRIBUTION

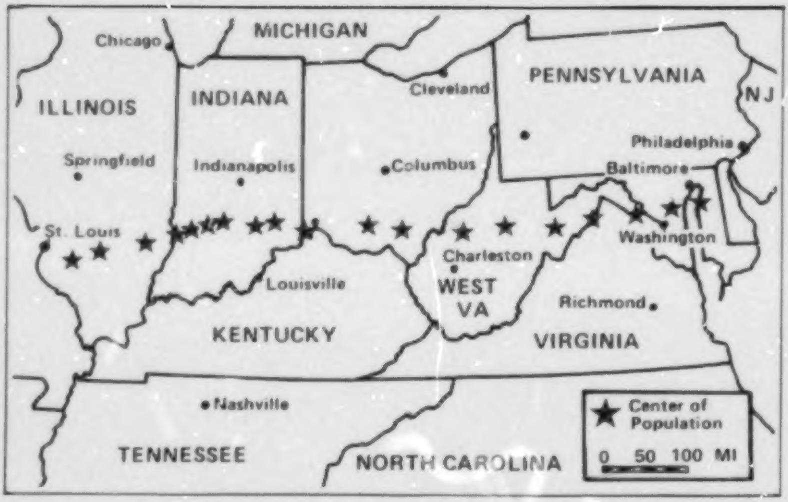
Implicit in the discussion of population size is the question, where have Americans lived in the past and where are they living today? For a variety of reasons, people tend to group together or cluster in some areas and not in others. The clusters are not static; they change over time. Demographers, geographers, and others who study population have long asked the where and why questions about population distribution. Their findings are regularly used by planners and administrators to provide a variety of public and private services (see the discussion of population and Federal funding programs discussed in chapter 3). This section examines two further questions about population distribution: (1) What were the major distribution patterns of the United States in the past, and (2) where are Americans living today?

Settlement History

When the first United States census was taken in 1790, a little under four million people lived in an area of about 865,000 square miles of land, (4.5 persons per square mile). Since that time, the population of the United States has multiplied 55 times over; the land area has more than tripled; and population density today has increased to over 60 persons per square mile.

The historic course of settlement in the United States has been westward, which is graphically portrayed by the shift in the center of population (see fig. 7-3). The center of population is defined as the point at which an imaginary flat, weightless, and rigid map of the United States would balance if weights of identical value were placed on it so that each weight represented the location of one person. At the time of the first census in 1790, almost two centuries after the first European settlements, most of the population still lived close to the Atlantic coastline; Louisiana was not yet part of the United States; and the center of population was located in Chesapeake Bay east of Baltimore, Md. Ten years later, at the opening of the 19th century, the center had moved west to a point close to Washington, D.C., which had just been established as the new capital city. In each succeeding decade, the center of population moved west, crossing the crest of the Appalachians in the1830's and the Ohio River in the 1850's. Western settlement accelerated after the Civil War, but slowed down from 1890 to 1940. New rural settlement in the West diminished and was counterbalanced by large-scale European immigration to the cities of the East. After World War II, population growth in the West again accelerated. By 1970, the center of population had almost reached the Mississippi River in the vicinity of St. Louis In contrast to the very slow movement from 1607 to 1790, in the 180 years between 1790 and 1970 the center of population moved about 700 miles west.

There has been an accelerating redistribution of the national population in the 20th century due to change in agriculture and transportation. One result is an increasing concentration of population within commuting distance of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Charleston
WEST VA
Louisville
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NORTH CAROLINA
Center of Population
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Figure 7-3. CENTER OF POPULATION, 1790 TO 1970

metropolitan areas accompanied by population decline in many traditional agricultural areas of the interior States (tables 7-3 and 7-4). In terms of the population distribution within the Nation, the overall growth of population in the West and South has not been as pronounced in this century as the shift of the center of population might suggest. The map of population distribution in 1970 (fig. 7-4) serves to remind the reader that the United States population remains characterized by large clusterings of population east of the Mississippi River, particularly around the Great Lakes and the New England and Middle Atlantic States.

POPULATION COMPOSITION

Demographers are not only concerned with the size and distribution of a population, but also with the demographic (age, sex, race), social, and economic characteristics of people. This perspective leads to a study of population composition.

There are many population characteristics or attributes for the demographer to investigate. The decision to focus on some characteristics and not on others is generally based on the extent to which the demographic processes of fertility, mortality, and migration are influenced by, or influence, the particular characteristic. A fundamental research question then becomes, which characteristic or characteristics ought to be investigated?

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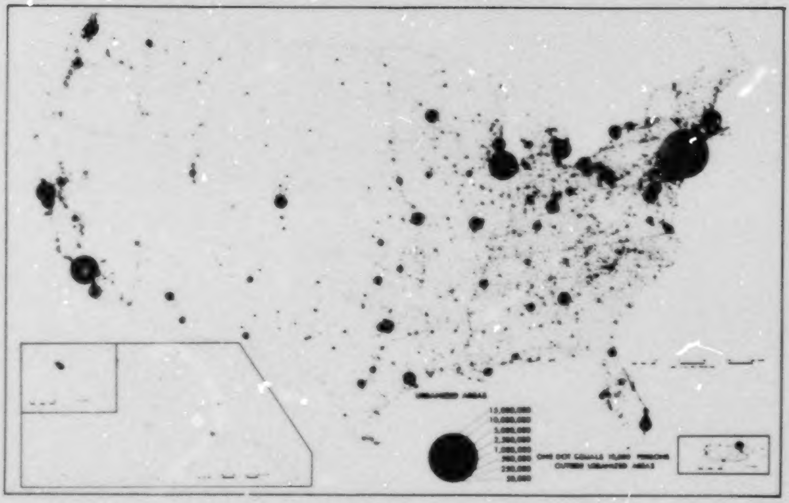


Figure 7-4. POPULATION DISTRIBUTION, 1970

The two most important characteristics are *age* and *sex*. The analysis of population structure depends upon these characteristics, which is why age and sex are often referred to as "the demographic variables." In fact, population change of any type can hardly be understood without taking age and sex into consideration.

Also of interest to demographers are the topics of *race* and *ethnic origin*. Most race and ethnic groups have distinctive demographic characteristics when compared to the majority population. For example, blacks and some Spanish-origin populations have less average formal education than the U.S. majority population, and they also have higher birth and death rates. Furthermore, the migration experiences of specific groups are usually not the same when compared to the majority group. Indeed there are relatively few areas in the United States so racially and ethnically homogeneous that these characteristics can be disregarded when studying their population composition. This section begins, then, with a review of fundamental population characteristics.

Sex

The characteristic of sex is an important variable in demographic studies. Separate data for males and females are important in themselves for the analysis of other types of data and in the evaluation of the completeness and accuracy of the census counts of population.

Many types of public and private planning (military, community institutions, social and health services, and sales programs) require separate population data for males and females. Social scientists have a vital interest in such data. Sex composition affects social, economic, and cultural relationships within a community.

A very large part of the usefulness of the sex characteristic in demographic statistics lies in its cross-classification with other characteristics in which one may be interested. For example, the effect of variations in the proportion of the sexes on measures of natality is considerable. This effect may make itself felt indirectly through the marriage rate. Generally, there are substantial differences between the death rates of the sexes; hence, the effect of variations in sex composition from one population group to another should be taken into account in comparative studies of general mortality. The analysis of labor supply requires separate information on males and females cross-classified with economic activity and age. In fact, a cross-classification with sex is useful for the effective analysis of nearly all types of data obtained in censuses and surveys, including data on racial and ethnic composition, educational status, and citizenship status, as well as the types of data mentioned above.

The definition and classification of sex present no substantial statistical problems. It is a readily ascertainable characteristic and the data are relatively easy to obtain. The situation with respect to sex contrasts with that of most other population characteristics, the definition and classification of which are much more complex because they involve numerous categories and are subject to alternative formulation as a result of cultural differences, differences in the uses to which the data will be put, and differences in the interpretations of respondents and enumerators.

Table 7-5 presents data on the ratio of males to females by age group and race from 1910 to 1977. Notice that the sex ratio varies not only over time but also according to age (e.g., under 14 to 65 and over), race, and ethnicity. These differences are often explained by the demographic variables of differential birth, death, and migration as related to social, economic, and political variables. For example, the high proportion of males in 1910, particularly in the 25-to-64-year-old group, is explained in part by the predominance of males in the international migration to the United States taking place during this and earlier periods.

Contrast the sex ratios for 45-to-64-year-olds in 1910 (114.4) and 1975 (91.71). In the latter year there were fewer men than women. Why? Unlike the previous example, there has not been a similar cycle of female migration to this country. Today, women live longer than men.

Sex Ratio

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. The sex ratio at birth in most countries is about 105 or 106 males per 100 females. After birth, sex ratios vary, because of different patterns of mortality and migration for males and females within the population.

$$\text{Sex Ratio} = \frac{\text{Number of Males}}{\text{Number of Females}} \times 100$$

Age

Age is the single most important variable in the study of mortality, fertility, and certain other areas of demographic analysis. Tabulations on age are essential in the computation of basic measures relating to the factors of population change, in the analysis of the factors of labor supply, and in the study of the problem of economic dependency. As with data on sex, a large part of the usefulness of the age classification lies in its cross-classification with other demographic characteristics in which one may be primarily interested. For example, the cross-classification of age with marital status, labor force, and migration makes possible a much more effective use of census data on these subjects. Since these social and economic characteristics vary so much with age and since age composition also varies in time and place, populations cannot be meaningfully compared with respect to these other characteristics unless age has been "controlled."

Age

The age of an individual in censuses is commonly defined in terms of the age of the person at his or her last birthday. Other definitions are possible and have been used. In some cases age has been defined in terms of the age at the nearest birthday or even the next birthday, but these definitions are no longer employed in national censuses.

Nature of Age Distributions

Data on age are commonly tabulated and published in 5-year groups or cohorts (0.4, 5-9, etc.). This detail is sufficient to provide an indication of the form of the age distribution and to serve most analytic uses. For some types of analysis, however, data for single years are needed. In some parts of the age range (i.e., the late teens, early twenties, late middle age) changes in some of the characteristics of the population (i.e., labor force status, marital status, school enrollment status) are so rapid that single-year-of-age data are required to present them adequately. For other analytic purposes age data may be combined to obtain figures for various broader groups than 5-year age groups. Age distributions consisting of combinations of 5-year age groups and 10-year age groups, or 10-year age groups only, may sometimes be published so as to achieve consolidation of masses of data and the reduction of sampling error, yet provide sufficient detail to indicate variations by age and permit alternative combinations of age groups.

Further consolidation or special combinations are desirable to represent special age groups. For fertility analysis the total number of women 15 to 44 years old (the childbearing ages) is significant; the population 5 to 17 is important in educational research and planning; and the group 18 to 24 roughly defines the college-age group, the group of prime military age, and the principal ages of labor force entry and marriage. For many purposes the number of persons 18 and over (age of legal majority) is useful. A classification of the total population into several mutually exclusive broad age groups with general functional significance may be found useful for a wide variety of analytic purpose. One classification employed in some of the publications of the Census Bureau is as follows: Under 5 years, the preschool ages; 5 to 17 years, the school ages; 18 to 44 years, the earlier working years; 45 to 64 years, the later working years; 65 years and over, the period of retirement. Any grouping of the ages into working ages, school ages, retirement ages, etc., is admittedly arbitrary and requires some adaptation to the customs and institutional practices of different areas or some modifications as these practices change. For example, in the early 19th century in the United States, the period of labor force participation was considerably longer than today, extending back into what are now the ages of compulsory school attendance and forward into the current ages of retirement. The interdependency of age groups is often expressed as the age-dependency ratio. (An overview of the age and sex of the United States population, 1800 to 1977 is provided in table 7-6.)

Age-Dependency Ratio

The age-dependency ratio is the ratio of persons in the "dependent" ages (under 15 and over 64 years) to those in the "economically productive" ages (15-64 years) in a population.

$$\frac{\text{U.S. Population under 15} + \text{U.S. Population 65 and over}}{\text{Population aged 15 - 64}} \times 100 = \frac{52{,}507{,}000 + 22{,}934{,}000}{139{,}677{,}000} \times 100 = 54.0$$

Thus, the age-dependency ratio in the U.S. in 1976 was 54. This means that there were 54 persons in the dependent ages for every 100 persons in the working ages. In other words, there were almost two persons working to support every one of the persons who were not in the labor force.

Special interest also attaches to the numbers reaching certain "threshold" ages in each year. These usually correspond to the initial ages of the functional groupings described in the previous paragraph. On reaching these ages, new social roles are assumed or new stages in the life cycle are begun (e.g., birth and reaching age 5 or 6, 18, 21, and 65).

Median Age

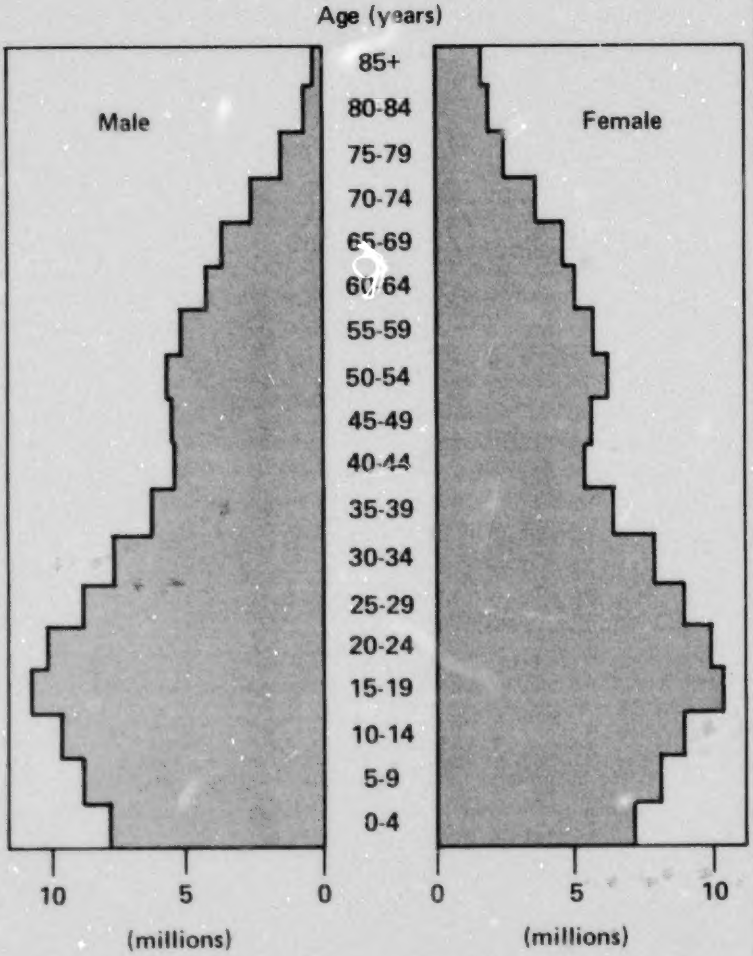
The age at which half the population is older and half is younger is a population's median age. The median age of the U.S. population in 1976 was 29 years.

Population Pyramid

An effective, widely used method of graphically depicting the age-sex composition of a population is called a population pyramid. A population pyramid gives a detailed picture of the age-sex structure of a population, indicating either single ages, 5-year groups, or other age combinations. Examples of alternate methods for presenting population data are given in table 7-7 and fig. 7-5. The basic pyramid form consists of bars, representing age groups in ascending order from the lowest to the highest, pyramided horizontally on one another (see fig. 7-5). The bars for males are given on the left of a central vertical axis and the bars for females are given on the right of the axis. The number of males or females in the particular age group is indicated by the length of the bars from the central axis. The age scale is usually shown straddling the central axis although it may be shown at the right or left of the pyramid only or both on the right and left, perhaps in terms of both age and year of birth. In general, the age groups in a given pyramid must have the same class interval and must be represented by bars of equal thickness. Pyramids most commonly show 5-year age groups.

Notice in fig. 7-5 that the bottom bar shows the number of males and females who were under 5 years of age in 1978, the bar located at age 30-34 on the pyramid represents all those alive and living in the United States in 1978 who were born 1943 to 1949, and so forth up to the pyramid's top, where very brief bars show the few surviving members of the birth cohorts born in the 1890's and before. Each year a new cohort is born and "appears" at the bottom of the pyramid, while the cohorts above it move up. As the cohorts age, they inevitably lose members because of death, and they may gain or lose because of migration. After age 45 this attrition process accelerates, causing the narrowing peak of most population pyramids.

A pyramid shows much about a population at a glance. Notice in fig. 7-5, for example, that females form the substantial majority in the oldest age groups because in the United States females outlive males, on the average,

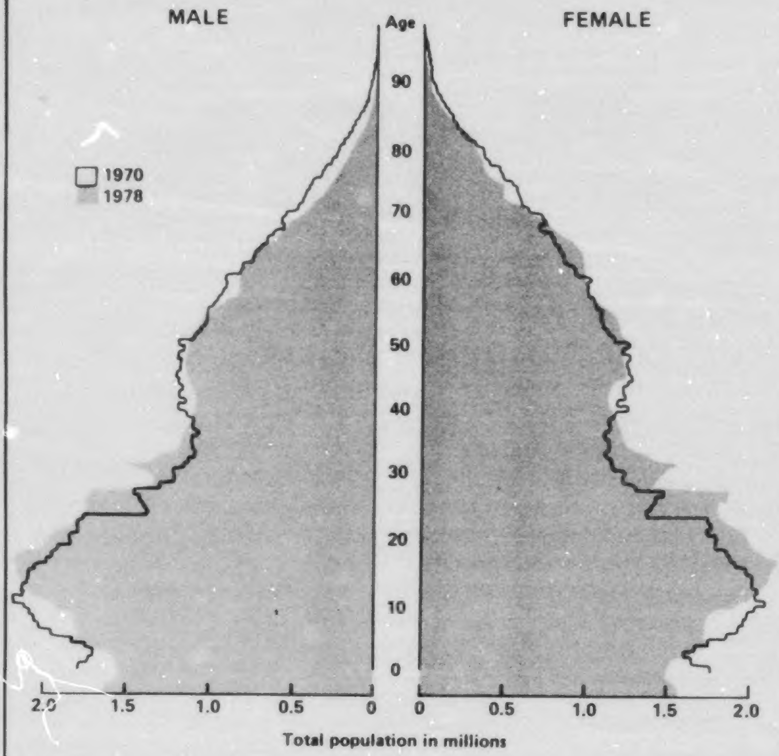


Source: U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 800, Tables 6 and 24.

Figure 7-5. POPULATION BY AGE AND SEX, 1978

by about 7 years. Notice also the slight majority of males at the very youngest ages because there are about 104 males born for every 100 females (table 7-5).

The pyramid's shape can give significant clues to a population's past and future. Look at the age groups 40 to 44 years old in the middle of the

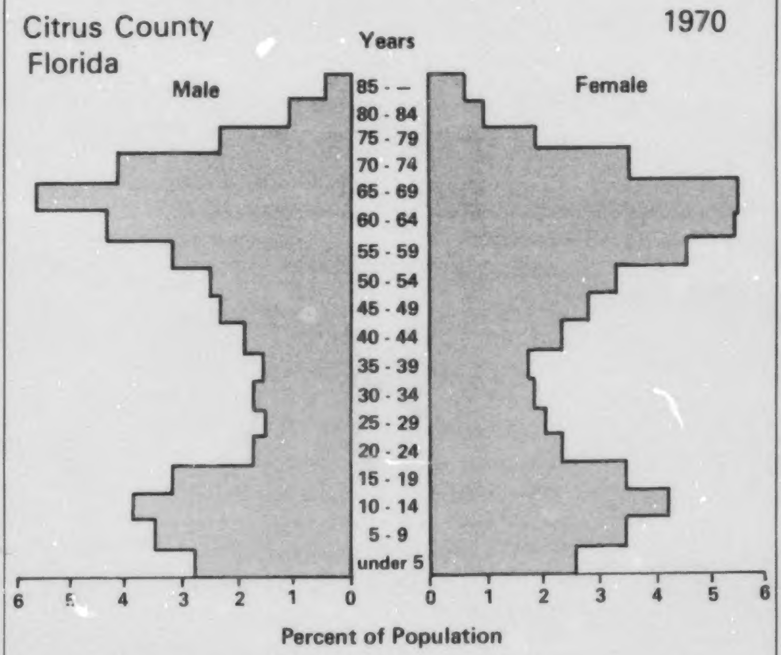


Source: Current Population Reports, Population Estimates and Projections, Series P-25, No. 900, April 1979, Tables 1 and 4.

Figure 7-6. DISTRIBUTION OF THE TOTAL POPULATION INCLUDING ARMED FORCES OVERSEAS, BY AGE AND SEX: APRIL 1, 1970 AND JULY 1, 1978

pyramid in fig. 7-5. This narrow middle section is the result of the sharply lowered birth rates of the 1930's, so that today the 1930's cohorts (now over 40 years of age) are fewer in number than the 1920's cohorts that preceded them, and much fewer than the post-World War II "cohorts" (now in their late teens, twenties, and early thirties).

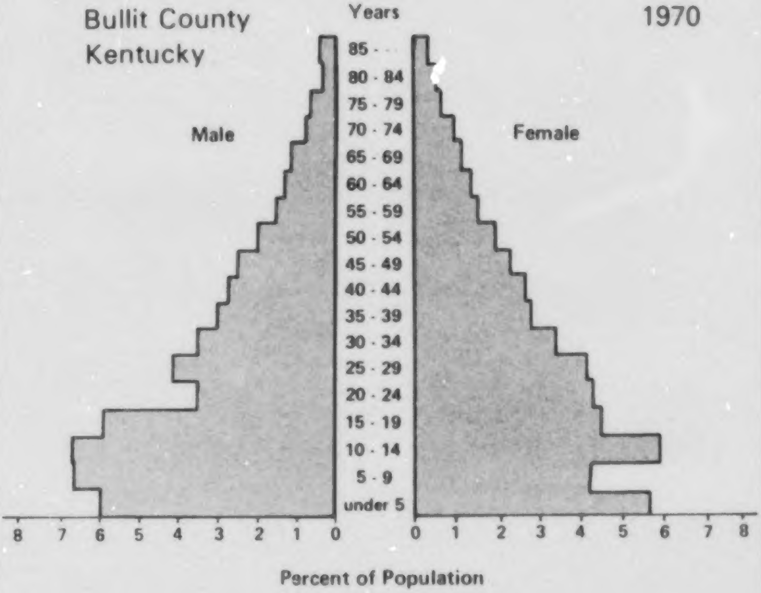
In more recent times, the bottom of the U.S. pyramid has again constricted sharply as birth cohorts have shrunk as a result of declining fertility rates. The direction of this has important long-range implications for population growth in the United States. Figure 7-6 depicts these changes for the period 1970-1978. There were fewer persons alive in the 13-year and under and the 38-year to 50-year age groups while the Post-World War II cohorts are part of the 15-year to 37-year pyramid bulge.



Source: U.S. Bureau of the Census
Census of Population: 1970
GENERAL POPULATION CHARACTERISTICS
Final Report PC(1)-B11 Florida

Figure 7-7. POPULATION PYRAMID: CITRUS COUNTY, FLORIDA, 1970

There are, of course, substantial variations within a country as to age and sex distributions. Some U.S. counties, for example, have large retired populations (fig. 7-7, Citrus County, Fla.) while others have relatively more children and young adults (fig. 7-8, Bullitt County, Ky.). Similar distinctions appear when population pyramids for racial and ethnic groups are compared. The age-sex pyramid for Filipino Americans living in urban areas outside Hawaii and California is distinguished by the greater number of females aged 20 to 44 (fig. 7-9).



Source: U.S. Bureau of the Census
Census of Population: 1970
GENERAL POPULATION CHARACTERISTICS
Final Report PC(1)-B19 Kentucky

Figure 7-8. POPULATION PYRAMID: BULLITT COUNTY, KENTUCKY, 1970

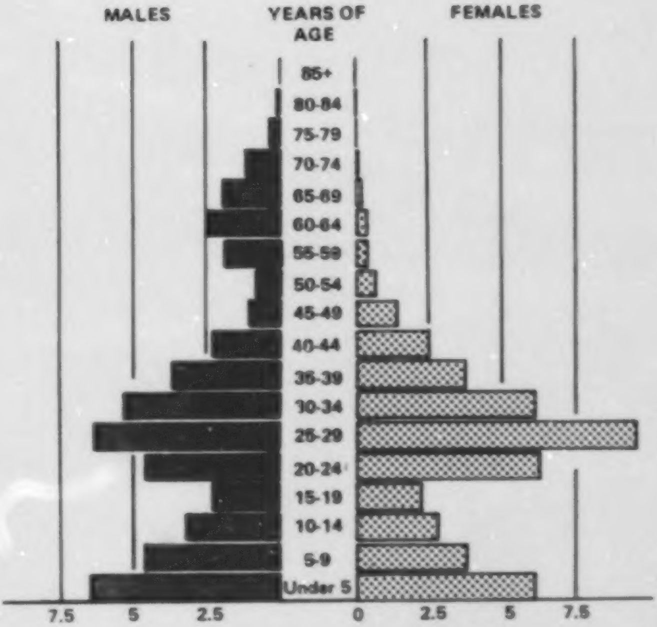


Figure 7-9. FILIPINO-AMERICANS IN URBAN AREAS OUTSIDE HAWAII AND CALIFORNIA

Race and Ethnicity

Anthropologists differ in their classification of races, but recognize three principal races. For purposes of demographic research, numerous races and ethnic groups are identified (see chapter 8 for specific definitions). While race and racial difference has certainly been the topic of numerous polemical publications, there are, nonetheless, important physical, cultural, and linguistic differences among large groups of people that are relatively persistent over time. Moreover, as suggested earlier, many populations' subgroups are of interest to demographers because they frequently exhibit demographic characteristics rates different from those of the larger or majority population. Physical anthropologists frequently point out that in the modern world most ethnic groups are of mixed racial origin. In compiling demographic records, however, we often use less precise classifications than those of the anthropologists. Indeed, we often base our classifications on how members of groups identify themselves and how they are regarded by their compatriots. Racial or ethnic groups so defined, however, are usually more meaningful from the standpoint of social programs and policy than those defined by anthropometric criteria. Although the resulting classification is neither scientific nor objective, it is reasonably consistent and reproducible.

The two largest minority groups in the United States are blacks and Spanish-origin people. An analysis of table 7-8 will show that these two groups differ from the majority population in numerous characteristics, thus attracting the attention and research efforts of demographers and others. For example, look at the figures for median family income in 1977. The substantial differences between white ($16,740), black ($9,563), and Spanish-origin families ($11,421) are facts discovered, in part, through the decennial census and various surveys. (Note that the white and black populations overlap with persons of Spanish origin, i.e., persons of Spanish origin may be of any race and therefore figure as components of the white and black populations with which they are compared here.) Social scientists and government agencies alike are interested in why these differences continue to exist and in devising approaches for reducing the distinctions.

Black Americans

At the time of the first census in 1790, the black population numbered about 757,000. A century later it had grown nearly tenfold, to 7.5 million. By the mid-1970's the number of blacks in the United States was over 24 million, more than 30 times the number in 1790.

Limited information is available on the size of the black population living in this country prior to the first census. In 1650, just a few years after the importation of black slaves began, it is estimated that the colonies contained about 1,600 blacks. Estimates of the black population at the time of the Revolution are 462,000 for 1770 and 562,000 for 1780.

The growth rate of the black population has varied considerably since the first decennial census. The black population grew at a rapid rate—in excess of 20 percent per year between the first census and the 1860 census, the census preceding the Civil War. The sustained growth can be attributed to two factors—the continued importation of slaves and the natural increase (excess of births over deaths) of the resident population (table 7-9). The importation of slaves into the United States was forbidden by law after January 1, 1808, but illicit slave traffic continued until the Civil War.

Following the Civil War, the growth rate of the black population experienced a downward trend as a result of the complete cessation of the slave trade and declines in fertility. This trend appears to have continued, with only a few interruptions, up to 1940 (table 7-9).

A pattern of more rapid growth of the black population developed after World War II; the growth rates in the 1950 to 1960 decade approached a level close to that of the pre-Civil War years. The average rate of growth in the 1970's showed a decline from the peak rate of the 1950's. Lowered fertility was the major factor contributing to this drop.

Blacks constituted a much larger proportion (19.3 percent) of the total population in the first census (1790) than in any succeeding census year. From 1790 to 1940, the proportion of blacks in the Nation declined, reflecting the more rapid growth rate of the white population, which resulted from the waves of immigration from Europe. The proportion of blacks began to rise after 1940 and reached 11.5 percent in 1975.

Each census from 1790 to 1910 indicated that about 9 out of every 10 black Americans lived in the Southern region. After 1910, this proportion began to decline and its downward movement accelerated during the 1940 to 1970 period because of the predominantly one-way migration stream from the South to the North. In 1940, three out of four blacks were residents of the South; by 1970 only one-half (53 percent) were in the South. This downward trend, however, appears to have halted in the 1970's, and in 1975 the proportion of blacks who lived in the South was about the same as the 1970 level (table 7-3).

As a consequence of blacks moving out of the South, the proportion of blacks in both the North and West has shown substantial increases over the years. The proportion of blacks in the North was 39 percent in 1975, almost four times the percentage in 1910. The West, which had only 1 percent of the black population in 1910, contained about 9 percent in 1975 (table 7-3).

In 1890 (the first census for which urban-rural data for blacks were available), most blacks (80 percent) resided in the rural areas. Eighty years later, the situation had completely reversed; blacks had become a highly urbanized population. Most of the urbanization occurred in the years after 1940, fed by the large influx of blacks to northern cities from southern rural areas (see table 7-4).

The 1970 census indicated that blacks were more urbanized than whites. Of the black population, 81 percent lived in urban areas compared with 72 percent of whites. Urban blacks have concentrated in the central cities of the largest metropolitan areas and continue to comprise an increasing proportion of the population in these cities. The proportion of blacks of the total central city population rose from 16 percent in 1960 to 23 percent in 1975, as a result of modest increases in the black population and the exodus of whites to the suburbs. The proportional increases of blacks in the large metropolitan areas (1 million or more) were even greater during this period (table 7-4).

The proportion of blacks in the total suburban population (outside central cities of metropolitan areas) showed a slight decline from 1960 to 1970. Since 1970, there is some evidence that the proportion has risen slightly, as a result of a higher annual rate of growth among blacks than among whites in the suburbs.

Persons of Spanish Origin

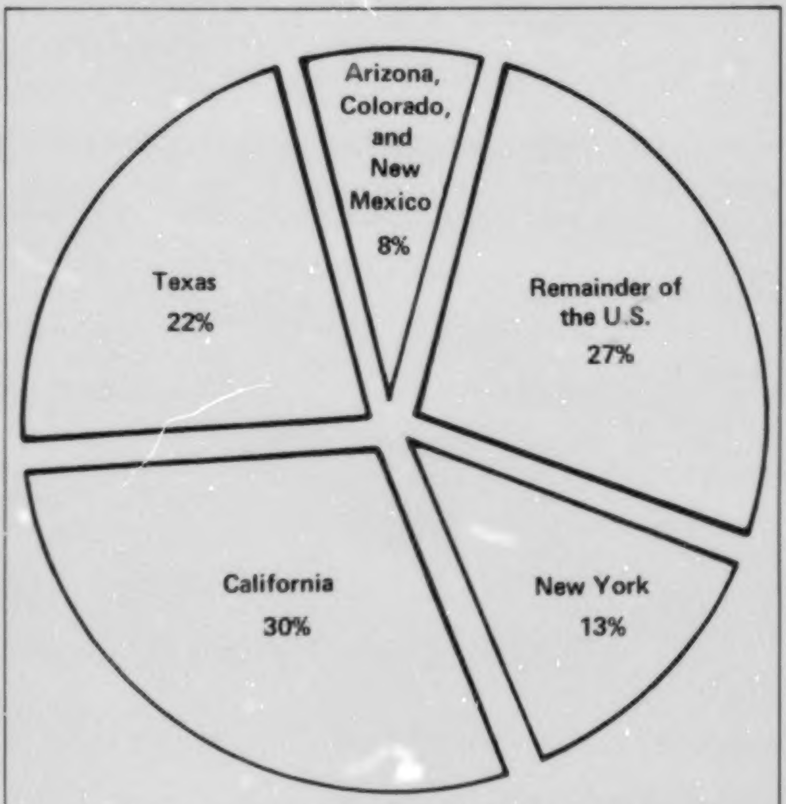
The second largest minority group in the United States consists of Spanish-origin persons, three-fifths of whom are of Mexican origin. In March 1978, there were 12 million persons of Spanish origin in the United States. Of these persons, about 7.2 million (59 percent) were of Mexican origin, 1.8 million (15 percent) were of Puerto Rican origin, 700,000 (6 percent) were of Cuban origin, and 2.4 million (20 percent) were of other Spanish origin (see table 7-10).

In general, the Spanish-origin population is young. The proportion of Spanish persons under 18 years of age was 42 percent, compared to 30 percent for the total population. And although the proportion of all persons 65 years old and over was 11 percent, the proportion of the Spanish-origin population in that age group was 4 percent.

About 84 percent of all Spanish- origin persons in 1978 lived in metropolitan areas, compared to 67 percent of the overall population. Furthermore, about 50 percent of all persons of Spanish origin lived in the central cities of the West and Southwestern United States (fig. 7-10 and table 7-11).

Although the overall educational level is lower for the Spanish-origin population than for the general population, there is evidence of increasing levels of educational attainment in the younger population of Spanish origin. For instance, by March 1978 only about 41 percent of Spanish-origin persons 25 years old and over were high school graduates, but the proportion of high school graduates among Spanish-origin persons 20 to 24 years old was 61 percent. The same pattern appears at the higher educational level: The proportion of Spanish-origin persons 20 to 24 years old who had completed some college was, at 26 percent, substantially higher than the proportion of Spanish-origin persons 25 years old and over with some college education (16 percent).

Spanish-origin families (i.e., families maintained by a person of Spanish origin) are, on the average, large families compared to all families in the United States; only 19 percent of all families in the Nation had five persons

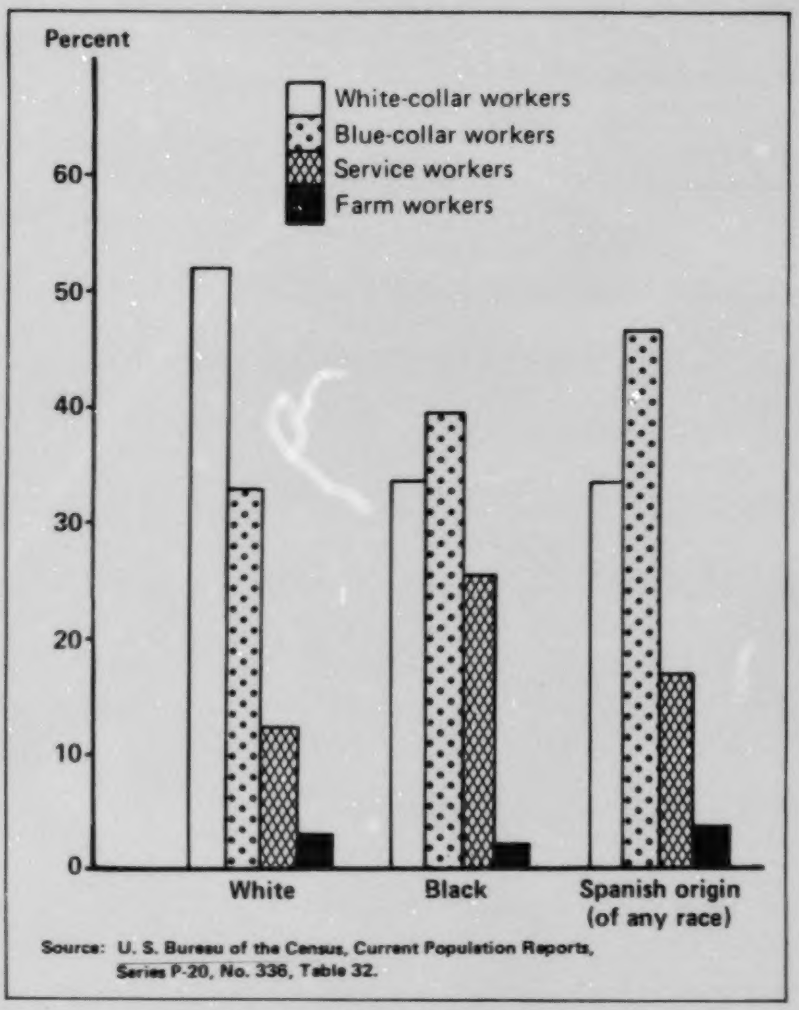


One of every 18 persons in the United States in 1978 was of Spanish origin or descent. The largest concentration of persons of Spanish origin was in the five Southwestern States and New York State.

Figure 7-10. PERCENT DISTRIBUTION OF PERSONS OF SPANISH ORIGIN, BY RESIDENCE

or more in the family, but 31 percent of all families of Spanish origin had five or more persons.

In March 1978 about 4.7 million persons of Spanish origin were in the civilian labor force, and the unemployment rate for these persons was, at 10 percent, about 3 percentage points higher than the unemployment rate for the total population. Also, about one of every two employed Spanish-origin persons was a blue-collar worker (fig. 7-11).



Source: U. S. Bureau of the Census, Current Population Reports, Series P-20, No. 336, Table 32.

Figure 7-11. BROAD OCCUPATION GROUP OF EMPLOYED PERSONS, BY RACE AND SPANISH ORIGIN, 1978

In 1977 the median individual income of Spanish-origin men 14 years old and over with income was significantly lower ($7,800) than the median income for all men ($10,100). Furthermore, the median income for Spanish-origin women ($3,700) was much lower than that for Spanish-origin men, but not significantly lower than for all women in the Nation ($3,900).

American Indians

The Bureau of the Census has collected and published substantial amounts of statistical information on Native Americans, since the first census question on this population group sought in 1860 to identify merely those Indians subject to Federal taxation. Since 1860, the Bureau has become more comprehensive in its approach to enumerating Native Americans—expanding and redefining concepts and the population covered.

American Indians are increasing at a rate four times the national average (see table 7-12). The total U.S. population increased by 13 percent over the 1960-1970 decade while the American Indian population increased by more than 51 percent. Such an increase may be due in part to more efficient enumeration; certainly as more American Indians take up permanent residence in urban areas they are less likely to be overlooked. However, higher figures mainly result from the continuing increase in the birth rate, reduction in infant mortality, and the effects of greater self-identification by many American Indians, who for many years had become absorbed into the general population. Additionally, much greater effort was made in the 1970 census to use American Indian enumerators who spoke the Indian languages and were familiar with the reservations.

American Indians live in all sections of the country. However, more than half lived in five States in 1970: Arizona, California, New Mexico, North Carolina, and Oklahoma. Nearly half of the American Indian population (49.7 percent) is concentrated in the West. More than a fourth are in the South, almost a fifth in the North Central region, and about a twentieth in the Northeast.

10 Largest Indian Tribes

Navajo	96,743
Cherokee	66,150
Sioux (Dakota)	47,825
Chippewa	41,946
Pueblo	30,971
Lumbee	27,520
Choctaw and Houma	23,562
Apache	22,993
Iroquois	21,473
Creek, Alabama and Coushatta	17,004

American Indians are leaving the reservations and rural areas for urban living in rapidly increasing numbers. In 1970 nearly half resided in urban areas; in 1960 the urban population was less than one-third. Another 215,770 American Indians lived on 115 major reservations, which the Census Bureau identified in 1970. The remainder lived on smaller reservations and in rural areas.

Asian Americans

Size and Composition. Among the Asian American populations in the United States, the largest in numbers are the Japanese, Chinese, and Filipinos. By 1970 their numbers reached 1,369,000, a 56 percent increase over the previous decade. During this same period, the population of the entire country increased only 13 percent.

The Japanese population in this country increased by 27 percent over the 1960 to 1970 decade—from 464,000 to 591,000. For the Chinese and Filipino populations, however, the increase was far greater; the Chinese population grew by 84 percent (from 237,000 to 435,000) and the Filipino population increased by 95 percent (from 176,000 to 343,000).

Asian Americans

Asian Americans constituted about 1 percent of the population in 1970. This total included:

Japanese-Americans	591,290
Chinese-Americans	435,062
Filipino-Americans	343,060
Turkish-Americans	107,000
Hawaiians	100,000
Lebanese-Americans	85,000
Indian-Americans	76,000
Israeli-Americans	59,000
Syrian-Americans	59,000
Pakistani-Americans	9,000
Other Western Asian Americans	88,000

About two-thirds of the additional persons added to the Japanese population were attributable to births—young children born in the United States between 1960 and 1970. Most of the increased population of the Chinese and Filipinos, on the other hand, was attributable to immigration. Two-thirds of the additional population in both these Asian subgroups were immigrants while the remaining third were childen born in the United States over the decade. The age-sex pyramids for the Japanese and Chinese populations highlight the structural distinctions between the two populations (fig. 7-12).

Distribution. Well over one-third of the Asian Americans lived in California in 1970. Thirty-six percent of all Japanese, 39 percent of all Chinese, and 40 percent of all Filipinos lived in the State. Combined with persons of other Asian origin, there were at least 600,000 Asian Americans living in California.

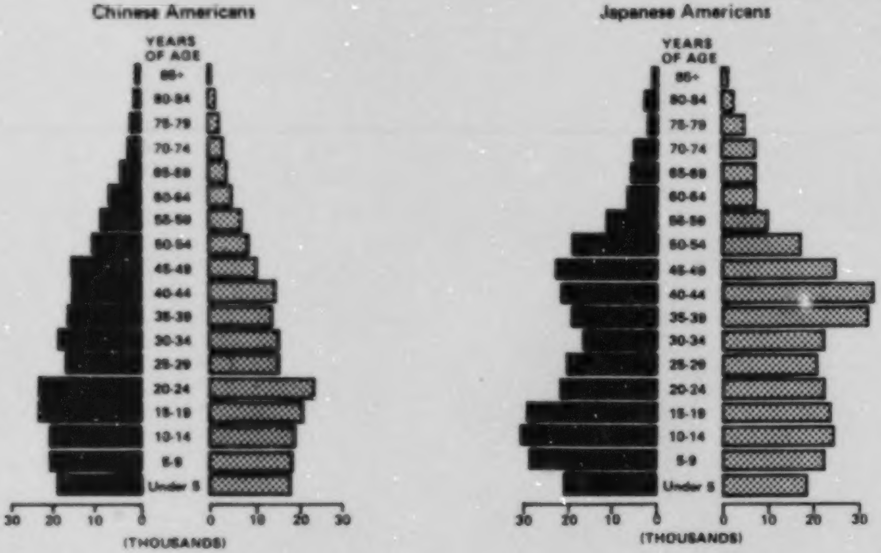
Another 27 percent of the three major Asian American populations lived in Hawaii. Thirty-six percent of the Japanese, 12 percent of the Chinese, and 28 percent of the Filipinos in the United States lived in that State.

About 81 percent of the Japanese and 74 percent of the Filipinos in the United States lived in the western part of the country. Among the Asians, only the Chinese had a large portion of their population outside the West. Of the Chinese, 27 percent lived in the Northeast—almost 20 percent of all Chinese lived in the State of New York alone.

While the Asian American population is clearly concentrated in certain parts of the country, the newly arriving Asian immigrants are not settling exclusively in these same areas. Some immigrants from Asia are settling in all the large cities in the most populous States.

POPULATION CHANGE

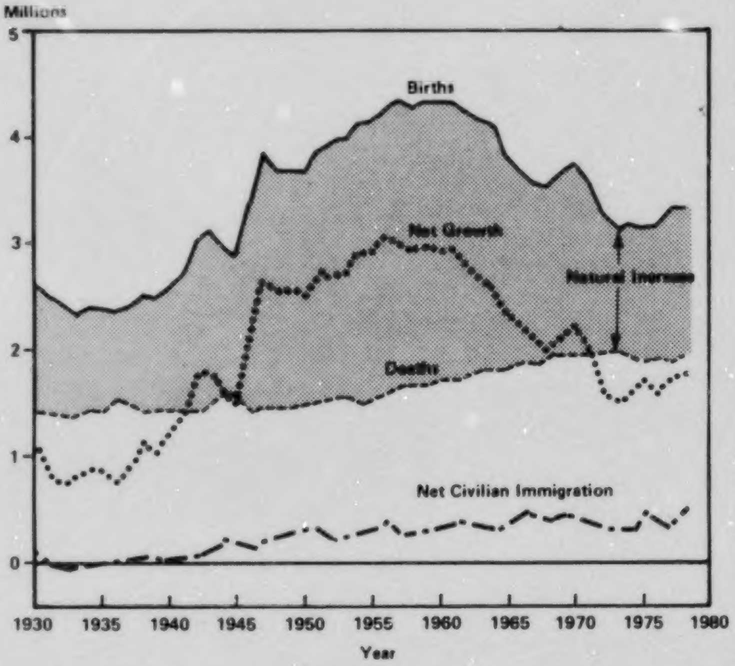
The previous sections introduced the demographer's role in explaining population size, distribution, and composition. Yet, as pointed out in the introduction to the chapter, demographers are also concerned with changes in these factors over time. Change results from three major processes: Fertility, mortality, and migration. Figure 7-13 summarizes the annual change processes for the United States 1930 to 1978, i.e., the fluctuations over time in births (fertility), deaths (mortality), and immigration. (Table 7-13 provides estimates of the components of population change for the United States, 1940 to 1978.) The remainder of this chapter will further define the three population change factors and provide additional methodological insights into the process of population change for the United States.



Chinese Americans

Japanese Americans

Figure 7-12. COMPARATIVE ASIAN AMERICAN AGE-SEX PYRAMIDS, 1970



Source: U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 336, Table 1.

Figure 7-13. ANNUAL LEVELS OF NET GROWTH, BIRTHS, DEATHS, AND NET IMMIGRATION, 1930 TO 1978

Fertility

Simply stated, fertility refers to the actual reproductive performance of a population. Births are dependent upon population composition and socio-economic circumstances. A high birthrate is not expected when the median age of a population is 50; conversely, a community with a high proportion of 20-to-40-year-old couples suggests the potential for childbearing.

Technically, the crude birth rate specifies the number of live births per 1,000 population in a given year. This is a very crude procedure for measuring fertility, but it will suffice for an introductory discussion. The crude birth rate (CBR), is expressed as follows:

$$\text{CBR} = \frac{\text{Births in year}}{\text{Population at mid-year}} \times 1000$$

Fertility Trends

The fluctuations in population growth since the Second World War have been largely a result of changes in fertility (table 7-14). The annual number of births peaked in 1957 at 4.3 million and declined to 3.5 million in 1968. After a slight increase in 1970 to 3.7 million, the number of births decreased and stayed between 3.1 and 3.2 million from 1973 to 1976. In 1977 the number of births increased slightly to just over 3.3 million and remained at virtually the same level in 1978.

General Fertility Rate

The general fertility rate (also called fertility rate) is the number of live births per 1,000 women aged 15-44 years in a given year. The general fertility rate is a more refined measure than the crude birthrate because it relates births more nearly to the age-sex group at risk of giving birth (i.e., women 15-44 years of age). This eliminates distortions that might arise because of different age and sex distributions in a total population. Thus, the general fertility rate is much more indicative of changes in fertility behavior than is the crude birthrate. For example, there were 65.8 births per 1,000 women aged 15-44 years in the United States in 1976.

$$\frac{\text{Number of births}}{\text{Number of women aged 15-44}} \times 1000 = \frac{3{,}165{,}000}{48{,}109{,}000} \times 1000 = 65.8$$

Total fertility patterns by State are shown in fig. 7-14. The State that had the greatest total fertility rate in 1975 was Utah (3,095), while Massachusetts (1,446) and Washington, D.C. (1,445) were lowest.

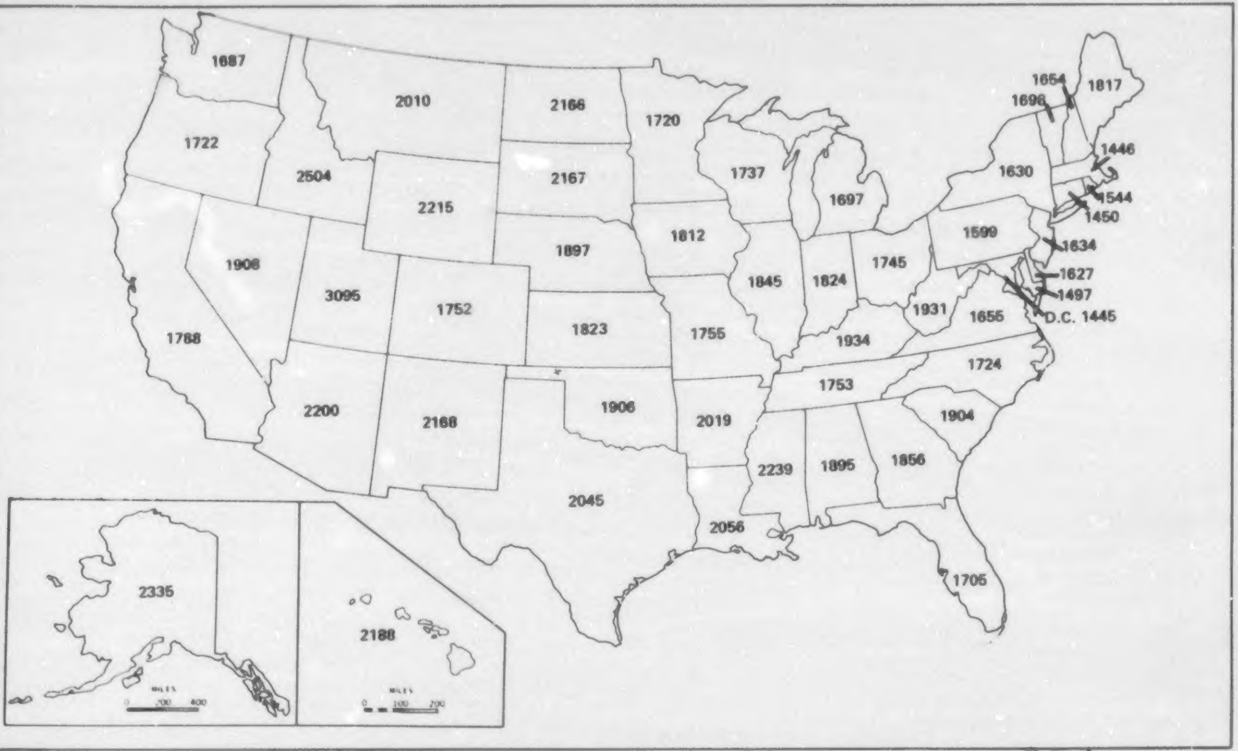

1687
2010
2166
1720
1654
1817
1698
1722
2504
2167
1737
1446
1630
2215
1697
1544
1450
1812
1599
1897
1634
1908
1845
1824
1745
1627
3095
1752
1497
1931
1655
D.C. 1445
1788
1823
1755
1934
1724
1753
2200
1906
2019
1904
2168
2239
1895
1856
2045
2056
1705
2335
MILES
0 200 400
2188
MILES
0 100 200

Figure 7-14. TOTAL FERTILITY RATE BY STATE, 1975

Total Fertility Rate

The total fertility rate is the number of births that 1,000 women would have in their lifetime if, at each year of age, they experienced the birth rates occurring in the specified calendar year. It should be stressed that the total fertility rate is an annual (or period) measure of fertility, even though it is expressed as a hypothetical lifetime (or cohort) measure. The total fertility rate is affected by the timing as well as the level of fertility and is thus subject to greater fluctuation than the cohort fertility rate. The following examples illustrate this point. The total fertility rate peaked in 1957 at 3,760. However, it now appears that the highest cohort fertility rate among women who were then in the childbearing ages will be about 3,200 for women born in the 1930's. The 1978 total fertility rate is estimated at 1,795. While it is possible that young women could complete their cohort fertility at this low level, recent survey data on birth expectations suggest that the actual figure may be somewhat higher. **See Current Population Reports**, Series P-20, No. 325, "Fertility of American Women: June 1977."

Mortality

Mortality is the technical term used to refer to death as a component of population change. Like fertility, death is measured and described differently depending upon the use of statistics. The crude death rate (CDR), or the number of deaths per 1,000 population in a given year, provides a description of mortality.

$$\text{CDR} = \frac{\text{Number of Deaths}}{\text{Total Population}} \times 1000$$

Other key measures include: Age-specific death rates, life expectancy, and cause-specific death rates.

Mortality Trends

There were about 1,925,000 deaths during 1978 in the United States. Although this was up from 1,901,000 deaths during 1977, the crude death rate remained at its 1977 level of 8.8 per 1,000, the lowest level in U.S. history (table 7-13). Over the past three decades, the crude death rate has declined slowly from as much as 11.0 per 1,000 during the 1940's, to about 9.5 during the 1950's and 1960's, and to 9.4 in 1970. Since 1970, however, more dramatic improvements in mortality rates have taken place. With the exception of persons 75 years and over, every age group experienced declines of 10 to 25 percent in mortality rates between 1970 and 1976. For those persons 75 to 84 and 85 years and over, death rates fell by 8 percent.

and 5 percent, respectively. Deaths due to cerebrovascular diseases, arteriosclerosis, diabetes millitus, accidents, and diseases of the heart had the largest declines.

Life expectancy at birth continued to rise, reaching 73.2 years for the total resident U.S. population. In 1977 the latest year for which data are available, the life expectancy at birth was 69.3 years for males and 77.2 years for females. This represents increases over 1976 of 0.4 percent and 0.7 percent, respectively. Improvements were slightly greater for the black and other-races population—life expectancy improved 1.5 percent, from 68.3 to 69.3 years—but the level still remained well below that of whites.

Comparative Historical Trends

The long-term trend of substantial increase of life expectancy at birth, which began in the late 1800's with the public health movement, continued well into the 20th century. In the early 1900's, the expectation of life for the black population was about 16 years less than that of the white population. (In the 1900 to 1902 period, expectation of life at birth for black males and females was about 33 and 35 years, respectively.) Greater relative gains in life expectancy on the part of the black population during the 20th century have greatly reduced this differential. Nevertheless, as of 1974, black males and females had a life expectancy at birth of 63 years and 71 years, respectively, which was still about 6 years less than that of whites (table 7-15).

Age-Specific Death Rate

Death rates can be obtained for specific age groups for comparison of mortality at different ages or a change in mortality at the same age over time. Since mortality varies greatly by sex and race, age-specific death rates are often given separately for males and females and for different racial groups in a population. For example, in the U.S. in 1976 the age-specific death rate for persons aged 25-34 years was 1.3 deaths per 1,000 population of that age. By comparison, the 1975 age-specific death rate for persons aged 65-74 in the U.S. was 31.9 per 1,000 of that age.

$$\frac{\text{Deaths of people aged 25 - 34}}{\text{Total Population aged 25 - 34}} \times 1000 = \frac{41{,}660}{32{,}044{,}000} \times 1000 = 1.3$$

Source: Population Reference Bureau.

Causes of Death

Early in this century, the principal causes of death were the infectious diseases of tuberculosis, pneumonia, influenza, and typhoid fever, and the principal childhood diseases such as scarlet fever, diptheria, whooping cough, and measles. In 1910 these diseases accounted for 37 percent of all black deaths and 26 percent of all white deaths. By 1974 their proportion of the total number of deaths had fallen to only 3 percent for both races (table 7-16 and 7-17).

Cause-Specific Death Rates

Cause-specific death rates are usually expressed in deaths per 100,000 because for most causes of deaths the rates of occurrence are so low. For example, in 1976, 174.2 persons per 100,000 population died of cancer in the U.S.

$$\frac{\text{Number of deaths from cancer}}{\text{Total population}} \text{ x } 100{,}000 = \frac{374{,}780}{215{,}118{,}000} \text{ x } 100{,}000 = 174.2$$

Source: Population Reference Bureau

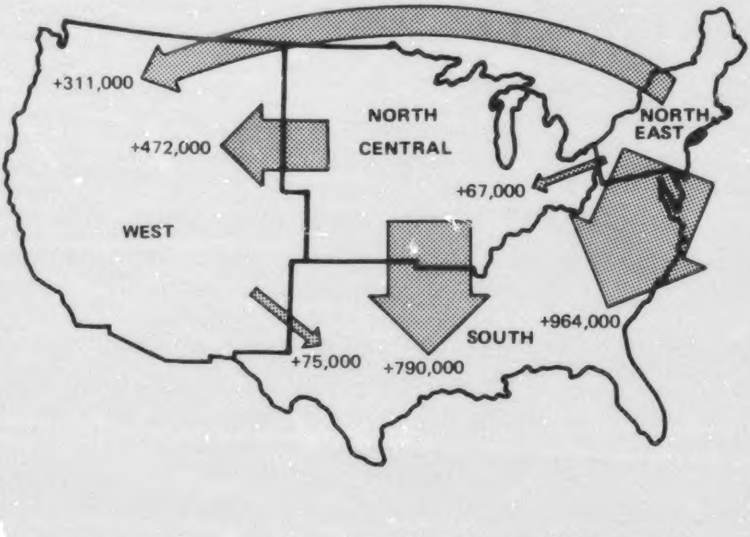
Tuberculosis, once called the "great white plague," was the chief cause of death for the black population in the early 1900's. With an improved standard of living, X-ray examinations to detect the disease in its early stages, and the use of antibiotics and other drugs, death rates from tuberculosis have declined sharply among both the black and white populations.

As the diseases of infancy, youth, and middle age were increasingly brought under control, diseases of old age became proportionately more important among the causes of death. In 1910 deaths due to malignant neoplasms (cancer) and diseases of the heart accounted for 12 percent of all black deaths and 16 percent of all white deaths; these same diseases constituted 46 percent of all black deaths and 58 percent of all white deaths in 1974.

A diverging trend in rates of accidental death can be seen in tables 7-16 and 7-17 depending on the type of accident. Deaths due to motor vehicle accidents have stabilized between 21 and 29 per 100,000 population since 1940 for both blacks and whites. Likewise accidental fatalities excluding motor vehicle accidents have continuously fallen and by 1974 were only 30 percent of the level recorded in 1910. For both the black and white populations, death rates due to homicide approximately doubled between 1960 and 1974; the rate for 1974 was 39.7 deaths per 100,000 for the black population and 5.8 deaths per 100,000 for the white population.

Migration

A particular problem arises in defining migration in a consistent manner. The Census Bureau has in the past used migration in the United States to mean a change in residence from one county to another while it defined mobility as a residential move within a county. Many data users today might ask whether a move from a rural farm to an urban center within the same county is not a more substantial move than a move from a rural farm area in one county to another rural farm area in the adjacent or nearby county; or whether a move from a lower-middle income section of a city to an upper-middle income section of that same city is not as much a move as a move from a lower-middle income section of one city to a lower-middle income section in another nearby town. For purposes of this chapter, migration is the movement of population; more exactly, the movement of people across a specified boundary for the purpose of changing residence. (Migration trends in the United States for the period 1970 to 1975 are highlighted in fig. 7-19.)



Source: *Population Redistribution in the United States in the 1970's,* by Brian J. L. Berry and Donald C. Dahmann. Washington, D.C., National Research Council, National Academy of Sciences, 1977.

Figure 7-15. U.S. MIGRATION TRENDS, 1970-1975

Measures of Migration

Whatever the type or scale of migration, every move involves leaving one place or area called the origin (outmigration) and arriving in another place called the destination (inmigration). If this movement involves the crossing of national borders, the terms are emigration and immigration. Gross migration is a term used to refer to the total of inmigrants and outmigrants:

$$GM = I + 0$$

where, I is the number of inmigrants, and

O is the number of outmigrants.

Net migration is the difference between the numbers of inmigrants and outmigrants:

$$NM = I - 0$$

If the actual number of inmigrants and outmigrants is not known, the net migration can be determined if the previous and present populations and the numbers of births and deaths for the interviewing period are known. Thus,

$$NM = P_2 - P_1 - B \pm D$$

where P_2 is the present population ;

P_1 is the original population;

B is the number of births during the period; and

D is the number of deaths during the period.

Mobility

Americans are often described as being highly mobile people. The use of "mobile" sometimes causes confusion unless care is taken to specify precisely what the word means.

"Mobility" as used in demography usually refers to spatial, physical, or geographic movement whereas in sociology it usually refers to a change in status (e.g., of occupation). The two concepts may be distinguished by calling one geographic mobility and the other social mobility, respectively.

The demographer's interests include (1) migration as a factor in population change and measures or estimates of migration for use in making current population estimates and population projections; (2) migration as usually the primary factor in population redistribution among geographic or type-of-residence areas; and (3) differentials in short-distance mobility and migration and the selectivity of those two types of movement.

The demographic mobility of our population shows variation according to *age with peaks in migration rates occurring for children under age 5 and* adults 20 to 34 years old (see fig. 7-16).

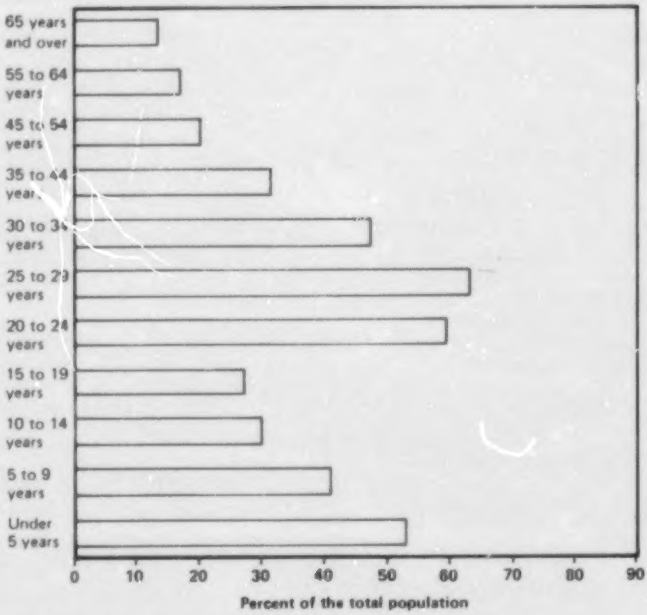
In the migration flows between areas there is generally a dominant stream and a lesser counterstream. People often move back and forth between two areas, not just in one direction. The rate at which the movement is taking place, called the migration rate, varies in its form but the measure is the number of moves during a year per 1,000 population at the middle of the year. Thus,

$$M = \frac{I + O}{P} \times 1000$$

where I is the number of inmigrants during the period;

O is the number of outmigrants during the period; and

P is the midperiod population.



Source: U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 331

Figure 7-16. PERCENT OF THE POPULATION 3 YEARS OLD AND OVER MOVING BETWEEN MARCH 1975 AND MARCH 1978, BY AGE

The inmigration rate is the number of inmigrants per 1,000 population during a period of time. Thus,

$$IMR = \frac{I}{P} \times 1000$$

where I is the number of inmigrants during the period and

P is the midperiod population.

Likewise, the outmigration rate is the number of outmigrants per 1,000 population during a period of time. Thus,

$$OMR = \frac{O}{P} \times 1000$$

where, O is the number of outmigrants during the period and

P is the midperiod population.

Net Civilian Immigration Trends

During 1978 net civilian immigration to the United States was estimated to be 343,000 or 1.6 per 1,000 population.

This volume of immigration was slightly greater than in 1977, when net civilian immigration was 315,000 or 1.5 per 1,000 population. The annual level of net civilian immigration has remained about the same since 1972, except for 1975 when a very large group of Vietnamese refugees entered the United States. Aside from such unusual events, fluctuations in the rate of net movement into or out of the country are due to (1) changes in the net movement between the United States and Puerto Rico and (2) changes in the movement of citizens affiliated with the Federal Government (civilian employees, their dependents, and dependents of the Armed Forces overseas). During 1977, for example, the net outflow of persons moving between the United States and Puerto Rico increased, and the number of civilian citizens affiliated with the Federal Government returning to the United States from abroad declined. In 1978, however, the net outflow of persons moving between the United States and Puerto Rico decreased somewhat.

Almost 20 percent of the net change in population during 1978 was due to net immigration, as compared with approximately 18 percent in 1977, 16 percent in the 1960's, and only 11 percent in the 1950's. This change in proportion was the result of the falling number of births rather than a rise in number of immigrants, which has remained relatively stable since the end of World War II. Although an increasing share of total growth is due to immigration, fertility is by far the largest contributor to change in population size. In 1978, for example, the number of "net immigrants" was barely one-tenth the number of births.

The Immigration Act of 1965 has resulted in a shift in the geographical origin and the racial composition of immigrants to the United States. In the past, immigrants have been predominantly white Europeans (table 7-18). Gradually, since 1965, the proportion of immigrants from Europe has declined from 42 percent of all alien immigrants in the year ending June 30, 1964 to just 16 percent in the year ending June 30, 1977 (the latest year for which data are available). Immigrants from Asia increased from 7 percent of the total to 37 percent during the same period. As a result, the proportion of immigrants of races other than white or black has grown substantially.

Because of the uncertainty about the number of undocumented or illegal aliens who have come to the United States, it is not feasible to include this group in the estimate of net civilian immigration.

Growth Rate

The growth rate is the rate at which a population is increasing (or decreasing) in a given year due to natural increase *and* net migration, expressed as a percentage of the base population. The growth rate takes into account all components of population growth: Births, deaths, and migration. It should never be confused with birthrate. Thus,

$$\frac{\text{Births 1976} - \text{Deaths 1976} + \text{Net migration 1976}}{\text{Total Population mid-1976}} \times K =$$

$$\frac{3{,}165{,}000 - 1{,}912{,}000 + 360{,}000}{215{,}118{,}000} \times 100 = 0.8$$

The growth rate can also be calculated from natural increase and net migration rates:

$$\begin{array}{c}\text{Rate of}\\ \text{natural increase}\end{array} + \begin{array}{c}\text{Net migration}\\ \text{rate}\end{array} = 0.6 + 0.2 = 0.8$$

In 1976, the U.S. annual growth rate was 0.8 percent.

Source: Population Reference Bureau

SUMMARY

Statistics on the U.S. population have been collected and published in decennial censuses since 1790, generally with increasing amounts of detail. Demographers have studied these statistics to better understand the growth, composition, and distribution of the U.S. population. The concepts and measures used by demographers to examine population change are studied under the heading of the population equation. Change in the United States population results from the influence of three components: Births, deaths, and net migration. Each of these basic componets has developed a different trend during recent years—trends that had to be considered during the planning for the 1980 census.

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Table 7-1. Components of Population Change for the United States for Selected Years: January 1, 1970 to January 1, 1979

(In thousands)

Calendar year	Population at beginning of period	Total increase[1]	Natural increase	Births	Deaths	Net civilian immigration
1979	219,530	(NA)	(NA)	(NA)	(NA)	(NA)
1978	217,785	1,745	1,403	3,328	1,925	343
1974	211,207	1,541	1,225	3,160	1,935	316
1970	203,849	2,227	1,812	3,739	1,927	428

NA Not available.

[1] Includes estimates of overseas admissions into and discharges from the Armed Forces and for 1970, includes error of closure between censuses.

Source: Data consistent with Bureau of the Census, *Current Population Reports*, series P-25, No. 793. Estimates of births and deaths (with an allowance for deaths to Armed Forces overseas) are from the National Center for Health Statistics. Estimates of net civilian immigration are based partly on data from the Immigration and Naturalization Service.

Table 7-2. Components of Population Change—States: 1960-1970 and 1970-1977

(In thousands, except percent. Total resident population. For explanation of methodology, see source. Minus sign (–) denotes decrease or net outmigration. See also, *Historical Statistics, Colonial Times to 1970*, series C25-75)

State	April 1, 1960 to April 1, 1970					April 1, 1970 to July 1, 1977				
	Net change				Net total migration[2]	Net change				Net total migration[2]
	Number	Percent[1]	Births	Deaths		Number	Percent[1]	Births	Deaths	
United States	23,912	13.3	39,033	18,192	3,070	13,027	6.4	23,870	13,982	3,140
New England	1,338	12.7	2,169	1,147	316	394	3.3	1,180	822	37
Maine	24	2.5	203	109	–69	91	9.2	117	78	52
New Hampshire	131	21.5	133	71	69	111	15.0	87	54	78
Vermont	55	14.1	85	45	15	39	8.7	52	32	18
Massachusetts	541	10.5	1,040	574	74	93	1.6	545	402	–51
Rhode Island	90	10.5	171	93	13	–15	–1.6	91	67	–39
Connecticut	497	19.6	537	255	214	76	2.5	288	190	–22
Middle Atlantic	3,034	8.9	6,725	3,749	59	–175	–.5	3,739	2,682	–1,232
New York	1,458	8.7	3,361	1,852	–51	–318	–1.7	1,850	1,295	–873
New Jersey	1,101	18.2	1,259	645	488	158	2.2	721	487	–76
Pennsylvania	475	4.2	2,105	1,252	–378	–16	–.1	1,168	901	–283
East North Central	4,028	11.1	7,832	3,652	–153	791	2.0	4,689	2,701	–1,197
Ohio	946	9.7	2,047	975	–126	44	.4	1,225	718	–464
Indiana	531	11.4	1,023	475	–16	135	2.6	630	349	–146

Table 7-2. Components of Population Change–States: 1960-1970 and 1970-1977 (cont.)

State	April 1, 1960 to April 1, 1970					April 1, 1970 to July 1, 1977				
	Net change					Net change				
	Number	Percent[1]	Births	Deaths	Net total migration[2]	Number	Percent[1]	Births	Deaths	Net total migration[2]
Illinois	1,033	10.2	2,153	1,077	–43	132	1.2	1,295	781	–382
Michigan	1,052	13.4	1,754	729	27	248	2.8	1,052	557	–247
Wisconsin	466	11.8	856	395	4	233	5.3	487	296	42
West North Central	930	6.0	3,133	1,604	–599	557	3.4	1,835	1,178	–100
Minnesota	391	11.5	744	327	–25	169	4.4	423	244	–11
Iowa	68	2.4	541	291	–183	54	1.9	306	209	–43
Missouri	358	8.3	857	502	2	123	2.6	523	367	–33
North Dakota	–15	–2.3	135	55	–94	36	5.8	75	41	1
South Dakota	–14	–2.1	146	65	–94	23	3.4	82	49	–11
Nebraska	72	5.1	291	146	–73	76	5.1	175	108	10
Kansas	70	3.2	419	218	–130	77	3.4	250	160	–13
South Atlantic	4,700	18.1	5,965	2,598	1,332	3,627	11.8	3,719	2,192	2,100
Delaware	102	22.8	109	45	38	34	6.1	64	35	5
Maryland	822	26.5	740	303	385	215	5.5	411	237	42
District of Columbia	–7	–1.0	182	89	–100	–67	–8.8	83	57	–92
Virginia	682	17.2	909	369	141	483	10.4	541	291	233
West Virginia	–116	–6.2	339	190	–265	115	6.6	210	144	49
North Carolina	526	11.5	1,032	412	–94	441	8.7	633	334	142
South Carolina	208	8.7	573	216	–149	285	11.0	359	172	98
Georgia	646	16.4	975	379	51	460	10.0	623	307	144
Florida	1,838	37.1	1,107	596	1,326	1,661	24.5	797	614	1,478

East South Central	754	6.3	2,665	1,213	–698	1,029	8.0	1,658	940	311
Kentucky	181	6.0	647	313	–153	238	7.4	408	242	72
Tennessee	357	10.0	755	353	–45	373	9.5	478	282	178
Alabama	177	5.4	729	319	–233	245	7.1	444	248	49
Mississippi	39	1.8	534	228	–267	172	7.8	329	169	13
West South Central	2,371	14.0	4,012	1,599	–42	2,380	12.3	2,655	1,314	1,040
Arkansas	137	7.7	401	193	-71	221	11.5	249	156	128
Louisiana	386	11.9	832	316	–130	277	7.6	504	247	19
Oklahoma	231	9.9	461	244	13	251	9.8	314	195	133
Texas	1,617	16.9	2,318	847	146	1,632	14.6	1,587	716	760
Mountain	1,429	20.8	1,724	602	307	1,741	21.0	1,265	509	985
Montana	20	2.9	144	66	–58	67	9.6	88	49	27
Idaho	46	6.9	146	58	–42	144	20.3	112	47	79
Wyoming	2	.7	70	28	–39	74	22.2	48	22	49
Colorado	453	25.8	401	163	215	409	18.5	290	130	249
New Mexico	65	6.8	263	68	–130	173	17.0	157	58	74
Arizona	470	36.1	365	122	228	520	29.3	282	119	358
Utah	169	18.9	245	65	–11	209	19.7	221	54	42
Nevada	203	71.3	91	31	144	145	29.6	67	31	108
Pacific	5,328	25.1	4,808	2,028	2,547	2,683	10.1	3,129	1,642	1,196
Washington	556	19.5	591	284	249	245	7.2	378	218	85
Oregon	323	18.2	346	182	159	285	13.6	241	147	191
California	4,236	27.0	3,634	1,511	2,113	1,925	9.6	2,342	1,235	817
Alaska	76	33.6	73	13	16	105	34.6	53	11	62
Hawaii	137	21.7	164	37	11	125	16.2	115	31	40

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[1] 1960 to 1970 based on 1960 population; 1970 to 1977 based on 1970 population.

[2] Comprises both net immigration from abroad and net interdivisional or interstate migration according to the area shown. Includes movements of persons in the Armed Forces.

Source: U.S. Bureau of the Census, *Current Population Reports*, series P-25, No. 460 and forthcoming report; and unpublished data.

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Table 7-3. Distribution of the Population, by Region for Selected Years: 1790 to 1975

Area and race	1790	1870	1910	1940	1960	1970	1975
BLACK							
United States (millions)	1	5	10	13	19	23	24
Percent, total	100	100	100	100	100	100	100
South	91	91	89	77	60	53	52
North	9	9	10	22	34	39	39
Northeast	9	4	5	11	16	19	18
North Central	–	6	6	11	18	20	20
West	–	–	1	1	6	8	9
WHITE							
United States (millions)	3	34	82	118	159	178	183
Percent, total	100	100	100	100	100	100	100
South	40	23	25	27	27	28	30
North	60	74	67	62	56	54	52
Northeast	60	36	31	29	26	25	24
North Central	–	38	36	33	30	29	28
West	–	3	8	11	16	18	18

BLACK AS A PERCENT OF THE TOTAL POPULATION

United States	19	13	11	10	11	11	11
South	35	36	30	24	21	19	19
North	3	2	2	4	7	8	9
Northeast	3	1	2	4	7	9	9
North Central	–	2	2	4	7	8	8
West	–	1	1	1	4	5	6

– Represents zero.

Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, special studies series P-23, No. 80, table 5.

Table 7-4. Distribution of the Population by Urban-Rural Residence and Nativity for Selected Years: 1890 to 1970

Year and race	Total population (thousands)	Percent residing in: Urban areas	Percent residing in: Rural areas: Total	Percent residing in: Rural areas: Farm	Foreign born: Number (thousands)	Foreign born: Percent of total population	Native: Number (thousands)	Native: Percent born in South[1]
BLACK								
1890	7,489	20	80	(NA)	20	–	7,469	[2]93
1910	9,828	27	73	(NA)	40	–	9,787	93
1940	12,866	49	51	35	84	1	12,782	[2]88
1950	15,045	62	38	21	114	1	14,931	[2]83
1960	18,849	73	27	8	125	1	18,723	75
1970	22,539	81	19	2	253	1	22,286	49
WHITE								
1890	55,101	38	62	(NA)	9,122	17	45,979	28
1910	81,732	49	51	(NA)	13,346	16	68,386	29
1940	118,702	57	43	22	11,419	10	107,282	30
1950	134,478	64	36	15	10,095	8	124,383	30
1960	158,838	70	30	7	9,294	6	149,544	30
1970	178,119	72	28	4	8,734	5	169,385	29

– Represents to zero.

NA Not available.

[1] Census Bureau evaluation studies for recent censuses (1960 and 1970) show that the figures for blacks born in the South have been seriously understated.

[2] Partially estimated.

NOTE: The current definition of the urban population includes urbanized areas and places of 2,500 or more outside urbanized areas. This concept has been in effect since 1950 when substantial revisions were made.

Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Special Studies series, P-23, No. 80, table 6.

Table 7-5. Ratio of Males to Females by Age Groups, 1910 to 1977, and by Race, 1977

(Represents number of males per 100 females. Total resident population)

AGE (years)	1910 (Apr. 15)	1920 (Jan. 1)	1930 (Apr. 1)	1940 (Apr. 1)	1950 (Apr. 1)	1960 (Apr. 1)	1970 (Apr. 1)	1975 (July 1)	1977 (July 1)			
									Total	White	Black	Spanish origin[1]
All ages	106.0	[2]104.1	[2]102.5	100.7	93.6	97.1	94.8	94.9	94.7	95.3	90.8	94.9
Under 14	102.1	102.1	102.6	103.0	103.7	103.4	103.9	104.2	104.3	104.8	101.5	105.4
14-24	101.2	97.3	98.4	98.9	98.2	98.7	98.7	101.3	101.5	102.3	96.1	94.1
25-44	110.2	105.1	101.8	98.5	96.4	95.7	95.5	96.5	96.6	98.6	84.0	87.3
45-64	114.4	115.2	109.1	105.2	100.1	95.7	91.6	91.7	91.9	92.6	86.0	90.2
65 and over	101.1	101.3	100.5	95.5	89.6	82.8	72.1	69.4	68.7	68.1	71.8	88.4

[1] March data. Persons of Spanish origin may be of any race. Computed from *Current Population Reports*, series P-20, forthcoming report.

[2] Includes "age not reported."

Source: U.S. Department of Commerce, Bureau of the Census, based on *U.S. Census of Population: 1950; 1960; and 1970*, part B; and *Current Population Reports*, series P-25, No. 721, and earlier issues.

Table 7-6. Population, By Sex, Race, Residence, and Median Age for Selected Years: 1800-1977

	Sex		Race		Median Age (years)		
Conterminous U.S.[1]	Male	Female	White	Black	All races	White	Black
1800 (Aug. 4)	(NA)	(NA)	4,306	1,002	(NA)	(NA)	(NA)
1850 (June 1)	11,833	11,354	19,553	3,639	18.9	19.2	17.3
1900 (June 1)	38,816	37,178	66,809	8,834	22.9	23.4	19.4
1950 (Apr. 1)	74,833	75,864	134,942	15,042	30.2	30.8	26.2
1977 (July 1, est.)	105,240	111,092	187,365	25,112	29.4	30.3	24.1

NA Not available.

[1] Excludes Alaska and Hawaii.

Source: U.S. Department of Commerce, Bureau of the Census, *U.S. Census of Population*: 1950, Vol. II, part 1; and *Current Population Reports*, series P-25, Nos. 614 and 721.

Table 7-7. Age and Sex of the Population of the United States: July 1, 1978

Age and sex	Percent Population	Percent distribution
AGE		
All ages	218,548	100.0
Under 5 years	15,361	7.0
5 to 13 years	31,378	14.4
14 to 17 years	16,639	7.6
18 to 24 years	28,944	13.2
25 to 34 years	33,936	15.5
35 to 44 years	24,383	11.2
45 to 54 years	23,184	10.6
55 to 64 years	20,668	9.5
65 years and over	24,054	11.0
SEX		
Male	6,502	48.7
Female	12,046	51.3

Source: U.S. Department of Commerce, Bureau of Census, *Current Population Reports*, series P-25, No. 800.

Table 7-8. Selected Characteristics by Race and Spanish Origin: 1978

(Numbers in thousands. Noninstitutional population excluding Armed Forces in barracks)

Selected characteristics	Total	White	Black	Spanish origin[1]
AGE				
Total population	214,159	185,405	24,839	12,046
Percent	100.0	100.0	100.0	100.0
Under 18 years	29.6	28.4	37.9	41.8
18 to 64 years	59.9	60.6	54.3	53.8
65 years and over	10.5	11.0	7.8	4.3
Median age	29.5	30.4	24.0	22.1
EDUCATION				
Total, 25 years and over	123,019	108,968	11,959	5,339
Percent high school graduates	65.9	67.9	47.6	40.8
Percent completed some college	29.8	30.9	18.6	16.3
Percent completed 4 or more years of college	15.7	16.4	7.2	7.1
Total, 20 to 24 years	19,561	16,790	2,395	1,185
Percent high school graduates	83.9	85.3	73.4	61.4
Percent completed some college	38.9	40.0	29.9	25.6
LABOR FORCE STATUS				
Persons, 16 years and over	158,941	139,580	16,641	[2]7,544
In civilian labor force	100,420	88,456	10,211	4,653
Percent in civilian labor force	63.2	63.4	61.4	61.7
Percent unemployed	6.0	5.2	12.6	9.5

Table 7-8. Selected Characteristics by Race and Spanish Origin: 1978 (cont.)

(Numbers in thousands. Noninstitutional population excluding Armed Forces in barracks)

Selected characteristics	Total	White	Black	Spanish origin[1]
INCOME IN 1977				
Median income of persons with income:				
Male, 14 years and over	$10,123	$10,603	$6,292	$7,797
Female, 14 years and over	$3,941	$4,001	$3,455	$3,669
Number below poverty level	24,720	16,416	7,726	2,700
Percent below poverty level	11.6	8.9	31.3	22.4
Total families	57,215	50,530	5,806	2,764
Percent	100.0	100.0	100.0	100.0
Under $5,000	9.3	7.6	24.0	15.8
$5,000 to $9,999	18.1	17.0	28.2	26.6
$10,000 to $14,999	18.4	18.5	18.0	22.8
$15,000 and over	54.1	56.9	29.9	34.7
Median family income	$16,009	$16,740	$9,563	$11,421

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[1] Persons of Spanish origin may be of any race.

[2] Unadjusted data for the month of March 1978.

Source: U.S. Bureau of the Census, *Current Population Reports*, series P-20, No. 328; series P-60, Nos. 118 and 119; and unpublished Current Population Survey data.

Table 7-9. Total Resident Population for Selected Years: 1790 to 1975

Year	Millions of Persons		Percent Black of total	Average annual rate of increase[1]	
	Total	Black		Total	Black
1790	3.9	0.8	19.3	(X)	(X)
1870[2]	39.8	5.4	13.5	2.36	1.94
1910	92.2	9.8	10.7	1.91	1.07
1940	132.2	12.9	9.7	0.70	0.79
1975	212.6	24.4	11.5	0.76	1.34

X Not applicable.

[1] Computed by the formula for continuous compounding, $P_1 = P_0 e^{rt}$

[2] Revised to include adjustment of 1,260,078 persons (512,163 Black and 747,915 White) for underenumeration in the Southern States. Unrevised census count is 38,558,371 for the total population and 4,880,009 for the Black population. Unadjusted data are used in subsequent tables because revised figures for States, age, etc., are not available.

Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Special Studies, series P-23, No. 80, table 1.

Table 7-10. Population of Spanish Origin by Sex and Type of Spanish Origin: March 1978

(Numbers in thousands. Noninstitutional population excluding Armed Forces in barracks)

Type of origin	Total		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Persons of Spanish origin	12,046	100.0	5,850	100.0	6,196	100.0
Mexican	7,151	59.4	3,528	60.3	3,623	58.5
Puerto Rican	1,823	15.1	825	14.1	997	16.1
Cuban	689	5.7	342	5.8	347	5.6
Central or South American	863	7.2	396	6.8	467	7.5
Other Spanish	1,519	12.6	758	13.0	761	12.3

Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, series P-20, No. 328.

Table 7-11. Residence of Spanish-Origin Families, by Type of Spanish Origin

(For the United States, March 1978. Numbers in thousands)

Area	Total Spanish origin	Mexican origin	Puerto Rican origin	Cuban origin	Other Spanish origin[1]	Not of Spanish origin[2]
Total families	2,764	1,623	437	186	518	54,451
Metropolitan areas	2,359	1,315	417	181	447	35,482
Central cities	1,412	752	345	69	246	13,948
Balance	948	563	71	112	202	21,533
Nonmetropolitan areas	405	308	21	5	71	18,969
PERCENT DISTRIBUTION						
Total families	100.0	100.0	100.0	100.0	100.0	100.0
Metropolitan areas	85.4	81.0	95.2	97.3	86.3	65.2
Central cities	51.1	46.3	79.0	37.1	47.5	25.6
Balance	34.3	34.7	16.2	60.2	39.0	39.5
Nonmetropolitan areas	14.6	19.0	4.8	2.7	13.7	34.8

[1] Includes Central or South American origin and other Spanish origin.

[2] Includes families maintained by persons who did not know or did not report on origin.

Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-20, No. 336.

Table 7-12. American Indian Population of the United States: 1900 to 1970

(Changes in the growth of the American Indian population resulted in part from differences in procedures for classifying persons of mixed racial descent. Minus sign (–) denotes decrease)

Census year	American Indian population	Change from preceding census	
		Number	Percent
1970	792,730	269,139	51.4
1960	523,591	166,092	46.5
1950	357,499	12,247	3.5
1940	345,252	1,900	0.6
1930	343,352	98,915	40.5
1920	244,437	–32,490	–11.7
1910	276,927	39,731	16.8
1900	237,196	––	––

Source: PC(1)-B1, General Population Characteristics.

Table 7-13. Estimates of the Components of Population Change for the United States Including Armed Forces Overseas: 1940 to 1978

(Numbers in thousands. Includes Alaska and Hawaii in all years)

				Components of Change During Period				Rate Per 1,000 Midyear Population				
Period	Population at Beginning of Period	Percent Change[1]	Net Change[2]	Natural Increase	Births[3]	Deaths[4]	Net Civilian Immigration	Net Change	Natural Increase	Births	Deaths	Net Civilian Immigration
Calendar Year												
1979	219,530	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
1978	217,785	0.80	1,745	1,403	3,328	1,925	343	8.0	6.4	15.2	8.8	1.6
1976	214,446	0.75	1,611	1,258	3,168	1,910	353	7.5	5.8	14.7	8.9	1.6
1974	211,207	0.73	1,541	1,225	3,160	1,935	316	7.3	5.8	14.9	9.1	1.5
1972	208,088	0.78	1,623	1,293	3,258	1,965	325	7.8	6.2	15.6	9.4	1.6
1970	203,849	1.09	2,227	1,812	3,739	1,927	438	10.9	8.8	18.2	9.4	2.1
1968	199,808	0.98	1,952	1,587	3,535	1,948	398	9.7	7.9	17.6	9.7	2.0
1966	195,539	1.12	2,197	1,773	3,642	1,869	455	11.2	9.0	18.5	9.5	2.3
1964	190,668	1.34	2,555	2,271	4,070	1,799	317	13.3	11.8	21.2	9.4	1.7
1962	185,242	1.50	2,771	2,455	4,213	1,758	351	14.9	13.2	22.6	9.4	1.9
1960	179,386	1.62	2,901	2,599	4,307	1,708	328	16.1	14.4	23.8	9.5	1.8
1958	173,533	1.68	2,915	2,623	4,279	1,655	292	16.7	15.0	24.5	9.5	1.7
1956	167,513	1.83	3,058	2,672	4,244	1,572	387	18.1	15.8	25.1	9.3	2.3
1954	161,690	1.79	2,898	2,613	4,102	1,489	287	17.8	16.0	25.2	9.1	1.8
1952	156,309	1.70	2,663	2,421	3,933	1,512	242	16.9	15.4	25.0	9.6	1.5
1950	151,135	1.65	2,486	2,177	3,645	1,468	299	16.3	14.3	23.9	9.6	2.0
1948	146,047	1.73	2,533	2,201	3,655	1,453	280	17.2	15.0	24.8	9.9	1.9
1946	141,229	1.53	2,165	2,018	3,426	1,409	151	15.3	14.2	24.1	9.9	1.1
1944	138,170	1.16	1,597	1,372	2,954	1,582	202	11.5	9.9	21.3	11.4	1.5
1942	134,657	1.27	1,714	1,595	3,002	1,407	83	12.7	11.8	22.2	10.4	0.6
1940	132,054	0.92	1,221	1,138	2,570	1,432	77	9.2	8.6	19.4	10.8	0.6

NA Not Available

[1] Percent of population at beginning of period

[2] Includes estimates of overseas admissions into and discharges from the Armed Forces and the error of closure between censuses

[3] Adjusted for underregistration through March 1970

[4] Deaths occurring in the United States plus estimated deaths occurring to Armed Forces overseas. Infant deaths adjusted for underregistration through March 1960

Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, series P-20, No. 802.

Table 7-14. Annual Measures of Fertility for Selected Years: 1930 to 1978

Calendar year	Crude birth rate[1]	General fertility rate[2]	Total fertility rate[2]
1978	15.2	[3] 66.5	[3] 1,795
1975	14.7	66.7	1,799
1970	18.2	87.9	2,480
1965	19.6	96.6	2,928
1960	23.8	118.0	3,654
1957	25.2	122.7	3,760
1950	23.9	106.2	3,091
1945	20.5	85.9	2,491
1940	19.4	79.9	2,301
1935	18.7	77.2	[4] 2,250
1930	21.3	89.2	[4] 2,600

[1] Including Alaska, Hawaii, and Armed Forces overseas. Births corrected for underregistration through March 1970.

[2] Resident population including Alaska since 1959 and Hawaii since 1960. Births corrected for underregistration through 1959. For 1930 to 1978, National Center for Health Statistics, *Vital Statistics of the United States*, 1975, Vol. 1, Natality, table 1-2 and table 1-6, and *Monthly Vital Statistics Report*, Final Natality Statistics, 1976, Vol. 26, No. 12, Supplement, tables 1 and 4, and unpublished data.

[3] General fertility rates for 1977 and 1978, unpublished estimates using registered births and estimate of resident females 15-44 in *Current Population Reports*, Series P-25, No. 800. Estimate of total fertility rate for 1978 based on indirect standardization and 1977 age-specific birth rates.

[4] Total fertility rates for 1930-1939 based on births adjusted for underregistration from National Center for Health Statistics (unpublished data consistent with birth rates published in National Center for Health Statistics, *Fertility Tables for Birth Cohorts by Color: United States*, 1917-73, April, 1976) and female resident population from *Current Population Reports*, Series P-25, No. 311.

Table 7-15. Life Expectancy at Birth, by Sex, for Selected 3-Year Averages, 1900 to 1961, and Single-Year Data, 1970 and 1974

(Years of life expected at birth. Statistics prior to 1933 are exclusive of States not yet included in the death registration area.)

Year and sex	Black and other races	White
MALE		
1900-1902	35.0	51.1
1909-1911	37.7	53.6
1919-1921	47.1	56.3
1929-1931	47.6	59.1
1939-1941	52.3	62.8
1949-1951	58.9	66.3
1959-1961	61.5	67.6
1970	61.3	68.0
1974	62.9	68.9
FEMALE		
1900-1902	35.0	51.1
1909-1911	37.7	53.6
1919-1921	46.9	58.5
1929-1931	49.5	62.7
1939-1941	55.5	67.3
1949-1951	62.7	72.0
1959-1961	66.5	74.2
1970	69.4	75.6
1974	71.2	76.6

Source: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics.

Table 7-16. Death Rates for the Black Population, by Selected Causes for Selected Years: 1910, 1940, and 1974

(Death rates per 100,000 population in specified group. Statistics prior to 1933 are exclusive of States not yet included in the death registration area)

Cause of death	1910	1940	1974
All causes	2,172.4	1,382.8	869.1
Tuberculosis, all forms	445.5	128.0	4.1
Syphilis and its sequelae[1]	30.8	54.3	0.5
Typhoid and paratyphoid fever	33.6	3.2	–
Scarlet fever and streptococcal sore throat	4.0	0.3	–
Diphtheria	11.6	1.8	–
Whooping cough	35.9	5.9	–
Measles	9.4	0.8	–
Malignant neoplasms[2]	54.0	78.4	144.1
Diabetes mellitus	7.2	17.9	21.9
Diseases of heart	204.8	248.5	258.0
Hypertension	(NA)	(NA)	5.3
Influenza and pneumonia[3]	273.6	125.4	25.7
Influenza	16.7	32.7	0.6
Pneumonia[3]	92.4	9.8	25.2
Cirrhosis of liver	11.0	5.8	20.4
Motor vehicle accidents[4]	1.0	23.8	22.0
All other accidents[5]	92.0	52.3	34.0
Suicide	11.8	4.6	6.5
Homicide	22.3	33.9	39.7
Certain diseases of early infancy	55.2	60.5	29.0
Bronchitis[6]	36.5	2.4	6.0

Represents or rounds to zero.

NA Not available.

NOTE: Data include persons of "other" races.

[1] Data for 1910 exclude aneurysm of the aorta.

[2] Includes neoplasms of lymphatic and hematopoietic tissues.

[3] Data for all years exclude pneumonia of newborn; data for 1910 exclude capillary bronchitis.

[4] Data for 1910 exclude automobile collisions with trains and streetcars, and motorcycle accidents.

[5] Data for 1910 include legal executions.

[6] Data for 1974 include emphysema and asthma.

Source: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics.

Table 7-17. Death Rates for the White Population, by Selected Causes for Selected Years: 1910, 1940, and 1974

(Death rates per 100,000 population in specified group. Statistics prior to 1933 are exclusive of States not yet included in the death registration area)

Cause of death	1910	1940	1974
All causes	1,448.8	1,041.5	921.9
Tuberculosis, all forms	145.9	36.6	1.3
Syphilis and its sequelae[1]	13.0	9.9	0.1
Typhoid and paratyphoid fever	22.2	0.9	–
Scarlet fever and streptococcal sore throat	11.6	0.5	–
Diphtheria	21.4	1.0	–
Whooping cough	11.0	1.8	–
Measles	12.5	0.5	–
Malignant neoplasms[2]	76.9	125.0	174.4
Diabetes mellitus	15.5	27.6	17.0
Diseases of heart	157.6	297.6	362.7
Hypertension	(NA)	(NA)	3.0
Influenza and pneumonia[3]	152.6	64.0	25.9
Influenza	14.1	13.3	1.1
Pneumonia[3]	49.7	2.8	24.8
Cirrhosis of liver	13.4	8.9	15.1
Motor vehicle accidents[4]	1.8	26.5	21.9
All other accidents[5]	82.5	46.4	26.6
Suicide	15.4	15.5	13.0
Homicide	4.1	3.2	5.8
Certain diseases of early infancy	34.7	36.8	11.3
Bronchitis[6]	23.5	3.1	13.7

– Represents or rounds to zero.

NA Not available.

[1] Data for 1910 exclude aneurysm of the aorta.

[2] Includes neoplasms of lymphatic and hematopoietic tissues.

[3] Data for all years exclude pneumonia of newborn; data for 1910 exclude capillary bronchitis.

[4] Data for 1910 exclude automobile collisions with trains and streetcars, and motorcycle accidents.

[5] Data for 1910 include legal executions.

[6] Data for 1974 include emphysema and asthma.

Source: U.S. Department of Health, Education, and Welfare, National Center for Health Statistics.

Table 7-18. U.S. Immigration: 1820 to 1977

(Through 1976, for years ending June 30, except as noted)

Period[1]	Number (thousands)	Rate[2]	Period[1]	Number	Rate[1]
1820-1977	**47,960**	**3.5**	1901-1910	8,795	10.4
1820-1830[3]	152	1.2	1911-1920	5,736	5.7
1831-1840[4]	599	3.9	1921-1930	4,107	3.5
1841-1850[5]	1,713	8.4	1931-1940	528	.4
1851-1860[5]	2,598	9.3	1941-1950	1,035	.7
1861-1870[6]	2,315	6.4	1951-1960	2,515	1.5
1871-1880	2,812	6.2	1961-1970	3,322	1.7
1881-1890	5,247	9.2	1971-1977	2,797	1.9
1891-1900	3,688	5.3			

Note: The peak periods for immigration were 1881-1930, (see the male-female ratio in table 7-5).

[1] For 1820-1867, alien passengers arriving; 1868-1891 and 1895-1897, immigrants arriving; 1892-1894 and 1898 to the present, immigrants admitted.

[2] Annual rate per 1,000 U.S. population. 10-year rate computed by dividing sum of arrival immigration totals by sum of annual U.S. pop. totals for same 10 years. Rates based on Bureau of the Census estimates as of July 1 for resident population through 1929, and for total population thereafter (excluding Alaska and Hawaii prior to 1959). Historical Statistics, Colonial Times to 1970, series C-89.

[3] Oct. 1, 1819 – Sept. 30, 1830.

[4] Oct. 1, 1830 – Dec. 31, 1840.

[5] Calendar year.

[6] Jan. 1, 1861 – June 30, 1870.

Source: U.S. Immigration & Naturalization Service, *Annual Report*.

PART III

THE 1980 CENSUS

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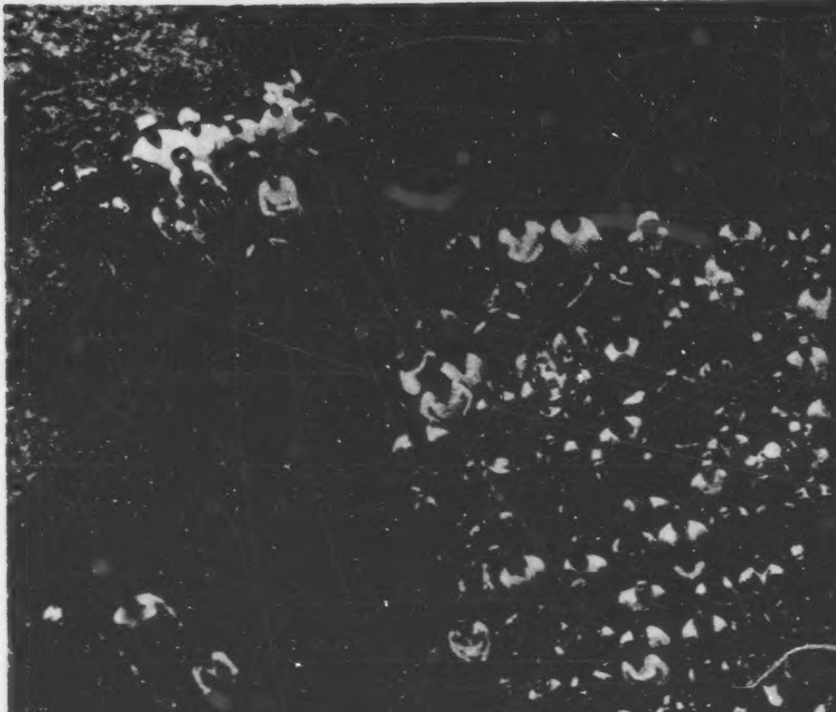
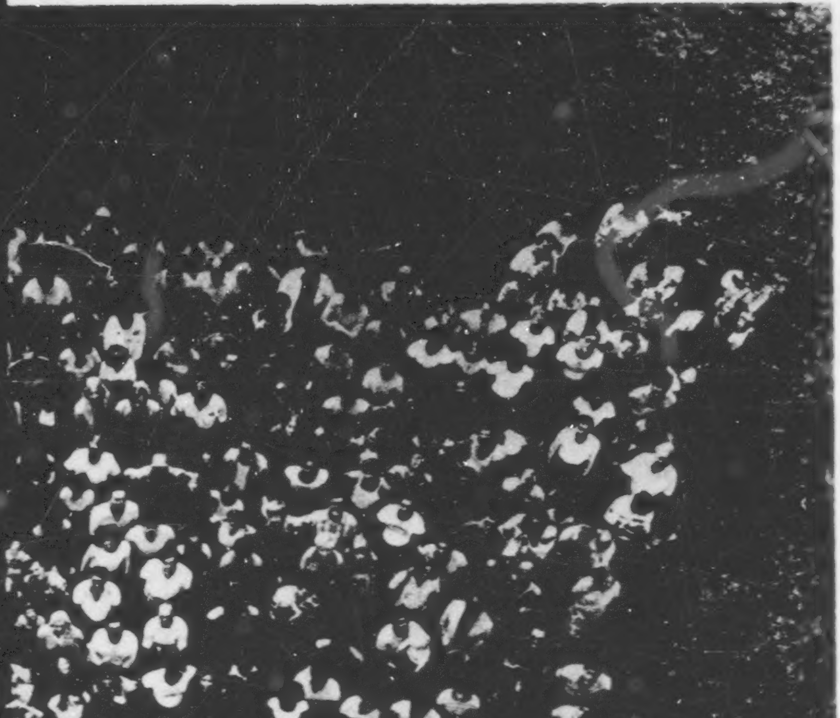


"The Living Map." Prepared for the Census Bureau by the Advertising Cou



INTRODUCTION

Planning for the 1980 Decennial Census of Population and Housing resembles, in many ways, the approach used by researchers elsewhere as they design an experiment. First, there is a *problem* to be defined. Simply stated, the Census Bureau's problem is to comply with the constitutional mandate to conduct a complete and accurate enumeration of the resident population of the United States (an estimated 222 million persons living in an estimated 86 million housing units). Compounding the planning problem are the two broad uses for the census results: (1) allocation (e.g., congressional apportionment, Federal revenue sharing), and (2) analysis (e.g., demographic and statistical research). Information to be used for demographic analysis does not have to be as exact (some uncertainty is permissible) as does information used for allocation purposes (where *no* uncertainty is permissible).

Chapter 8 outlines the 1980 *research design*. Advice from private citizens, advisory committees, and Federal agencies provided suggestions regarding the overall census plan, what questions to ask, who to ask (sampling method), and how to test the research design (pretests and dress rehearsals). Additionally, the Census Bureau staff conducted a *literature review* to determine what could be learned from past censuses. For instance, evaluations by Bureau personnel and its many advisory groups of the 1970 census and the continuing census survey programs provided useful information regarding coverage, cost, and enumerator recruiting topics.

The *field procedures* to be used in the decennial census are reviewed in chapter 9. While most citizens will only come into direct contact with the Census Bureau as they complete their questionnaire, the Bureau has established field offices and comprehensive procedures to ensure that the questionnaires are delivered to the household and that the completed questionnaires are collected and processed accurately. Part III concludes with a discussion of plans for the *findings* (e.g., products) and the data user services designed by the Census Bureau to make the 1980 enumeration results readily accessible (chapter 10).

Chapter 8

THE CENSUS PLAN

INTRODUCTION

Formal planning work on the 1980 census began July 1, 1973, immediately following the conclusion of the 1970 census period on June 30. Recognition by both the executive and congressional branches of the U.S. Government that work on the decennial census should be a continuing activity (which first occurred when the 1960 census period ended) constituted a major advance in public and political understanding of the importance of the census itself and of statistical operations in general. The simple fact recognized by each group is that a decennial census requires an enormous amount of preparation and planning.

The purpose of this chapter is to introduce the range of planning activities necessary for the 1980 decennial census. Specific treatment is given to the activities leading up to April 1, 1980 and the Census Questionnaire. Chapters 9 and 10 provide substantial detail for the actual data collection and tabulation effort and the plans for data dissemination and services.

Starting in 1973, the Census Bureau reviewed the broad spectrum of the 1970 census experience, established general timetables, and initiated a number of test activities. The Bureau also undertook a large-scale effort to elicit information from all segments of the American society on their data needs and their recommendations for the 1980 census. This effort to go outside of the Census Bureau to solicit policy advice and technical aid reflects the importance of the decennial census today.

One such effort involved a request by the Secretary of Commerce to the Committee on National Statistics of the National Academy of Sciences (NAS)-National Research Council (NRC) to undertake an independent evaluation of the technical and procedural designs for the 1980 census. A 14 member panel on decennial census plans produced a report focusing attention on the 1980 census plans and procedures. The main points of the report are summarized below.

First, there has been a rising demand for the Census Bureau's product—not only from those who want more knowledge of the scope and location of societal problems, community needs, or economic markets but also from those who want their share of public funds and governmental services. This means that interested individuals and groups as well as State and local governments will evaluate critically, and often in politically controversial ways, the Census Bureau's performance in 1980.

Second, there has been almost a quantum jump in the cost of conducting the census, reflecting its growing complexity. The 1980 census will cost close to $1 billion (compared to $221.6 million for the 1970 census) and doubtless future censuses will cost more. Cost-effective decisions are required at every possible point: What questions to ask, what kinds of searches for missing people to undertake, what enumeration procedures to adopt, and what data base for count adjustments, if any, to compile.

Third, there are changes in the American way of life (changes in life style, in labor force composition, and in public attitudes toward governmental surveys) that make the task of census enumeration more difficult in 1980 than at any time in the last century. Each of these changes seriously affects both the quality and coverage of census results.

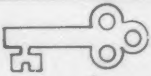
Overall, people are harder to find. Some, such as illegal aliens and certain separated spouses, deliberately seek to avoid being counted although census data are confidential and do not identify individuals. For others, new life styles have complicated the census taker's work: Recreational vehicles become permanent residences, people live in communal arrangements, shared custody arrangements for dependents of divorced parents are more popular, and there are more people of all ages who live alone, all of whom need to be reached and counted.

At the same time, the labor force has changed. In past decades, the Census Bureau could fill thousands of short-duration jobs of enumerators and field coordinating personnel quite easily, especially with relatively well-educated homemakers who worked conscientiously and took civic pride in working for the census for a few weeks before again leaving the labor market. Temporary workers with such characteristics are not available in large numbers for the 1980 census; one reason is that the proportion of families in which both husband and wife hold permanent jobs has grown substantially.

The increasing proportion of married women who work also reduces the proportion of households that can be enumerated during regular working hours. This requires more callbacks and evening work, raises costs, and creates special problems in high-crime areas.

In racially and ethnically homogeneous locales, the premium that is placed on hiring persons of the same race and ethnic background further

1980 CENSUS KEY DATES



1974 - 1975	Series of 73 public meetings across the country to elicit suggestions and ideas for the 1980 census.
April 1976	Test census of Travis County (Austin), Texas.
September 1976	Test census of Camden, New Jersey.
April 1977	Test census of Oakland, California.
March 31, 1978	Submit list of specific questions planned for 1980 Census to the Congress.
April 4, 1978	Dress Rehearsal censuses in Richmond, Virginia area and La Plata and Montezuma Counties, Colo.
September 12, 1978	Dress Rehearsal census of Lower Manhattan, New York City.
October 1978	Planning begins with Advertising Council for national promotion campaign.
January 1979	Begin prelist operation to build master mailing lists.
February 1979	Local review program launched; involves elected officials in all 39,000 U.S. political jurisdictions.
April 1979	Short and long form questionnaires go to print.
June 1979	U.S. Postal Service checks commercial address list for completeness and accuracy.
July 1979	Begin assembling and addressing questionnaire mailing pieces (86+ million).
January 1980	409 temporary field district offices open.
March 5, 1980	Local post offices perform predelivery address check on questionnaires.
March 28, 1980	Postal Service delivers census forms to 86 million households.
April 1, 1980	Census Day; data collection begins.
July - Nov. 1980	Preliminary reports on population and housing counts.
Dec. 1980 - June 1981	Publication of number of inhabitants.
January 1, 1981	Deliver final State counts to President.
April 1, 1981	Deliver State redistricting counts.
May 1981 - Oct. 1983	Publication of detailed characteristics.

complicates the staffing problem; it underscores the complex issues of race, ethnicity, class, and sex, as well as equity involved in the recruitment and selection of enumerators.

Moreover, many people believe that Americans are less willing now than in the past to cooperate freely with officialdom, more reluctant to accept as benign the efforts of the Census Bureau to gather detailed and personal information. This then is the societal context in which the plans and key dates for the 1980 census were debated and implemented.

EVALUATION OF PAST CENSUSES

As noted in the National Research Council report, *Counting the People in 1980*, it is virtually impossible to count every single inhabitant of the United States—at any cost. Some undercount of the population occurs in all censuses, even in small countries with relatively homogeneous populations such as Sweden or Norway. Because underenumeration differs by geographic area, by race, in some cases by ethnic origin, and perhaps systematically with the incidence of poverty and educational deficiencies, an undercount has serious ramifications. Increasing concern about population coverage reflects the growing awareness of the political, economic, and social consequences of the decennial census.

Another impetus for the increasing concern about the undercount is the growing self-consciousness and desire for recognition on the part of the cultural, racial, and ethnic groups and their desire to share equitably in social and economic programs. It is obvious that an adequate and accurate data base is needed to measure progress under various social programs and also to measure the effects of policies and programs designed to remedy past discrimination. For these and many other reasons the undercount is a critical issue and one that generates substantial political and social pressure on the Census Bureau.

To better improve its coverage, the Census Bureau has conducted a series of studies to find ways to reduce the national undercount. For example, studies of the 1960 census indicate that approximately half of the undercount resulted from missing entire households and half from missing individuals within enumerated households. For the 1970 Census of Population and Housing, the Bureau sponsored three types of coverage studies—population coverage, housing coverage, and several related studies (see table 8-1). As a result of this research effort, the Bureau has developed procedures to improve the census-taking process in order to attain a relatively low overall undercoverage rate and to take steps to reduce the coverage differential.

Table 8-1. Published 1970 Census Coverage Evaluation Studies[1]

Population Coverage	Purpose
A. Demographic Analysis (PHC(E)#4)	To estimate the net coverage error for the total U.S. population. This is the major undercount study for 1970.
B. Medicare Record Check (PHC(E)#7)	To measure the omission and overenumeration of persons 65 years of age and over. Medicare enrollment files were used.
C. Birth Registration Test (PHC(E)#2)	To measure the completeness of birth registration for children under 5 years of age.
D. CPS-Census Match (PHC(E)#11)	To identify, primarily, "within" household omissions in order to discover why such omissions happened. The March, 1970 CPS sample units were matched with census records for this experiment.
E. Special Procedures to Improve 1970 Census Coverage (PHC(E)#6)	To measure the effect of various census procedures on coverage improvement.
Housing Coverage	
A. CPS-Census Match (PHC(E)#5)	To provide estimates of housing undercount for the total U.S. Again, the March, 1970 CPS sample units were used.

Table 8-1. Published 1970 Census Coverage Evaluation Studies[1] (Cont.)

Population Coverage	Purpose
B. Mail Area Coverage (PHC(E)#5)	To provide estimates of omission, overenumeration, and the net coverage error for housing units in mail census areas.
C. Definitional Housing Unit Errors (PHC(E)#5)	To measure the extent of definitional error in the census housing count (e.g., two households at an address which the census lists as a one-family home).
Other Related Studies	
A. Geographic Coding Study (PHC(E)#1)	To measure the amount of residential address mis-coding to geography (e.g., wrong block or tract).
B. Mail Extension Test (PHC(E)#3)	To determine the feasibility of conducting a mail census in rural areas.

[1] References to coverage from previous censuses are cited from the published Evaluation and Research Program series, PHC(E).

Pretests for the 1980 Census

Most major data collection efforts require field testing. For the Bureau of the Census, those tests were conducted in two phases (i.e., pretest censuses and dress rehearsals). The major purpose of a pretest census is to test field collection methodology and organization, including coverage improvement techniques, as well as a limited number of subject content items. Travis County (Austin), Tex., was selected for the first pretest because of its large and diverse minority population, its size, the availability of an up-to-date address list, and the availability of a GBF/DIME File (see chapter 4 for GBF/DIME text).

The Travis County census included a number of feasibility and alternative tests as part of the field activities. Most of these tests were focused on coverage improvement and included alternative procedures to reduce the errors resulting from the misclassification of occupied units as vacant; the testing of a procedure to check independent lists of names to census records after the enumeration was completed; a check against census records of those persons who moved near census day; and, the use of a Spanish language questionnaire.

The Travis County census was also the first full-scale test of the local review program. In previous censuses, preliminary counts of population for large geographic entities, such as counties and cities, were compiled in the local census office after all operations were completed, and these counts were made public. Errors and inconsistencies for smaller geographic areas were discovered after the local offices were closed, and it was often difficult and expensive to correct these errors.

Three additional pretests were conducted in preparation for the 1980 census. The city of Camden, N.J., was selected as the site for a second pretest using the same techniques as in Travis, with modification as required as results from Travis became known. Then, to deal with and rectify some of the problems encountered in Travis and Camden and also to improve some of the procedures that were effective, the Bureau conducted a pretest census in the city of Oakland, Calif. Finally, the Bureau conducted a pretest of census procedures and questionnaires in selected areas of Puerto Rico.

COVERAGE IMPROVEMENTS

There are many ways that people can be missed in the census. An entire living unit (and all its occupants) can be missed, or the living unit can be enumerated but some of its occupants missed either through lack of understanding about who should be enumerated or through an unwillingness to be enumerated.

Field Procedures

The basic data collection procedures to be used for the 1980 census are similar to those used in 1970. About 90 percent of the population (as compared to 60 percent in 1970) will be enumerated by the mail-out/mail-back system. The balance of the population will be enumerated by the traditional door-to-door visit by an enumerator, commonly referred to as the *conventional* or nonmail method. In mail census areas, the initial mailing list is produced by one of two methods. In large urban areas, mailing addresses are purchased from commercial mailing firms. These addresses are on computer tape and are usually referred to collectively as the Tape Address Register or TAR. In the balance of the mail area, census enumerators prepare the address list by canvassing the area and recording each mailing address. This operation is called the *prelist*. The increase in the extent of the mail census and expanded use of commercial mailing lists as the first step in creating a list of addresses may in themselves lead to better coverage. Chapter 9 will discuss these coverage improvement procedures in more detail.

Special Communication Efforts

Many efforts will be made to encourage public support of the census. Most of these efforts have special emphasis for racial and ethnic populations,

Dress Rehearsals for the 1980 Census

The final phase of the preparatory activities prior to the census is the dress rehearsal program. As the name implies, the dress rehearsal is basically a dry run of all of the census methods and procedures the Bureau expects to employ in the actual census.

The major site for the 1980 Dress Rehearsal Program was the Richmond, Va. area, comprising the city of Richmond and the suburban counties of Chesterfield and Henrico. It is an area of approximately half a million population with a large minority population and a typical suburban area. Census day was Tuesday, April 4, 1978. The centralized mail procedure used in each of the pretests was used to cover most of Richmond city, and the decentralized procedure (see chapter 9) modified from 1970 was used to cover the balance of the area. The mail return rates from the dress rehearsal program were encouraging. Compared to mail return rates of approximately 77 percent in Travis, 50 percent in Camden, and 57 percent in Oakland, the mail-return rate from the centralized area was approximately 72 percent, somewhat higher than expected, while from the decentralized area it was approximately 79 percent, about the expected rate. Overall in Richmond, the mail-return rate was approximately 74 percent.

At the same time the mail census was conducted in Richmond, the conventional enumeration procedure was used in a census of two small counties in southwestern Colorado—LaPlata and Montezuma. These counties are typical of the areas in which this data collection procedure will be utilized. They are counties of low population density, large geographic area, contain seasonal living quarters, and have two Indian reservations located within them.

As an additional dress rehearsal activity, a census was conducted on September 26, 1978 in a portion of New York City, specifically that area south of Houston Street in Manhattan. It is an area that in 1970 contained approximately 120,000 persons with a broadly diversified minority population. The purpose of this activity was to give the Bureau one final reading on its field methodology in an inner city portion of a large metropolitan area.

Defining Minority

A "minority" can be almost any group of people that shares a particular economic level, citizenship status, color, race, national origin, language, physical handicap, sex, age, or any combination of these that gives that group important social significance.

Many of the Census Bureau's statistics about minorities are published in terms of racial or ethnic groups. These include blacks, Asians and Pacific Islanders, American Indians, and Aleuts and Eskimos. The Spanish/Hispanic population has been identified in the past variously by mother tongue, surname, origin, or Puerto Rican birth or parentage. The Bureau's current surveys use the identified "Spanish origin," broken down into Mexican (Mexican American, Chicano), Cuban, Puerto Rican, Central or South American, and "Other Spanish."

which for simplicity are referred to as minorities. The populations of primary concern are the black population, the Spanish-origin population, American Indians (Native Americans), Aleuts and Eskimos, and Asian Americans and Pacific peoples. There are two main efforts in this area—the Minority Statistics Program and the Special Publicity Efforts.

Minority Statistics Program. The main purpose of the Minority Statistics Program is to attempt to raise the level of the coverage of minority populations to that of other segments of the population. The specific objectives of the program are: To advise members of minority populations concerning the usefulness of statistics provided by the Census Bureau, to assist them in the use of such statistics, and to obtain their recommendations and support towards improving coverage and the quality of data in the 1980 census. The Minority Statistics Program has three main components, which are discussed below.

1. *Advisory Committee Program.* This program area provides organized channels of communication between members of the minority populations and the Bureau of the Census on the problems of the 1980 census as they relate to the specific minority populations. Three committees were established: The Census Advisory Committee on the Black Population for the 1980 Census; the Census Advisory Committee on the Spanish-Origin Population for the 1980 Census; and the Census Advisory Committee on the Asian and Pacific American Population for the 1980 Census. Members were drawn from a broad spectrum of community leaders, scholars, elected officials, marketing and media experts, and clergy. Advisory conferences with Native Americans were conducted through visits of Census Bureau staff with various tribal groups.
2. *National Services Program.* This program area is aimed at developing channels of communication with members of the minority populations through contacts with minority organizations that are national in scope.

Bureau representatives attended and, to the extent possible, participated in national conventions and meetings of selected minority national organizations. The types of organizations covered include civil rights, economic and welfare rights, religious, media, professional, and business groups.

3. *Community Services Program.* This program area is aimed at developing channels of communication with minority groups and individuals at regional, State, and local levels.

Community Services Representatives contact local individuals and groups that have, or can exert, influence upon persons who, under ordinary circumstances, might not be enumerated in the census. The program seeks to obtain the trust and active cooperation of such groups and individuals, to illustrate the value of census data, and to convince them of the confidentiality of information furnished to the census.

Community Services Representatives actively involve organizations and individuals in local communities in planning for the census. For the 1980 census, over 200 Community Service Representatives are active in this capacity.

According to the National Research Council, census coverage involves five critical steps.

> In a broad sense, the census involves the Government's attempt to communicate with the people in a detailed and specific way—by sending out a set of questions (messages) and by receiving replies to those questions (feedback) from the people. Incompleteness of coverage, viewed in this way, may be thought of as a failure or breakdown in the communicative process. The failure may involve any stage of the process: (1) A failure to deliver the messages to the people; (2) a failure to attract the attention of the people to the messages; (3) a failure to send messages that are properly perceived or understood, for example, sending forms in a language that some people cannot read or sending forms that contain questions that are too difficult for people to answer; (4) a failure to send messages that properly motivate people to respond, for example, giving inadequate explanations of why detailed information is needed; or (5) a failure to send messages that can be acted on in the social setting in which the potential respondent lives, for example, is it reasonable to assume that undocumented aliens in the American Southwest and elsewhere live in a social climate that will permit them to answer the kinds of questions included in the census?

The Census Bureau recognizes the importance of public information and communication media to the accurate enumeration of the American population. Therefore, as in past censuses, the Census Bureau has mounted a massive publicity campaign to inform everyone of the 1980 census and its importance. In addition to the standard publicity efforts directed at the mass media, a series of special publicity activities directed at the minority and ethnic media were developed. Some of these efforts included:

—Hire minority Public Information personnel to implement the program.

—Develop TV and radio spots specifically designed to reach minority and ethnic audiences.

—Develop printed literature of all types for distribution in minority and ethnic communities.

—Develop programs of working with minority disc jockeys to help promote the census.

—Obtain testimonials from prominent leaders in minority/ethnic communities.

—Arrange for minority advertising agencies to play a vital role in the Advertising Council-backed national campaign for the census.

—Develop special public service announcements on the Census Bureau's hiring of minority/ethnic persons as temporary census employees.

Advertising and the 1980 Census

A major element of the 1980 census promotion campaign will be the use of time and space in mass communication outlets—essentially the broadcast and print media—to "advertise" the census.

In recent censuses, the Bureau relied upon the Advertising Council for this task, which obtained the free services of a major advertising agency for creative work and free time and space in the media for the Council's public service projects. Cost to the Census Bureau was nominal. The Council estimated that about $8 1/2 million in free time and space was contributed by the media during the 1970 census.

The Census Bureau had three possibilities for the advertising campaign for 1980: (1) To rely solely upon paid advertising; (2) to mount a two-pronged campaign involving the Council's effort supplemented by a strategically designed paid campaign; or (3) to use the "free advertising" method traditionally employed by the Council. The Bureau investigated all three options and decided again to use the facilities of the Advertising Council.

Local Review

Another major matter requiring planning activity is the issue of how to produce population counts for counties and cities, as well as their component parts, more rapidly and accurately than has been done in any previous decennial census. In the last few censuses, the goal has been to produce the final population counts for all legal entities at the same time as the State totals are fixed. Not only is this an important public service, but it avoids any later discrepancies between the sum of component areas and the State total. In the 1970 census, the Census Bureau released, at that time, population counts for enumeration districts and block groups with a clear caution that the figures were unofficial and subject to change. The immediate need for breakdowns within the legally incorporated areas was so great that these unofficial figures were used quite extensively without regard to the Bureau's warning. Because of a substantial number of processing and geographic coding discrepancies discovered largely during the tabulation of the counts for individual blocks, many enumeration districts and block group population figures had to be revised, and even some of the published official counts for counties and cities had to be corrected. All these changes created problems for State and local authorities.

In 1980 the Census Bureau plans to meet this major public need by attempting to simultaneously produce the final official population counts for all of the above-mentioned legal and statistical entities, including the 2.5 million blocks. It should be noted that these final counts cannot be produced manually in the field offices nor in the central processing office. For a number of operational reasons, the counts must come through the same computer framework that will later yield the data on subject characteristics.

One of the primary elements in accomplishing this massive tabulation job is to improve the quality of the materials returned from the field operations so that the processing can flow with greater speed and efficiency. Here, the Bureau is helped by certain features of the mail-out/mail-back system of data collection that it introduced in 1970. This system requires a list of geographically coded addresses prior to the enumeration. The Census Bureau can, therefore, provide preenumeration counts of housing units by small areas to the local authorities for them to review. In view of the increasing awareness of local authorities to the significance of census population counts, most local officials are expected to cooperate in this initial review. After the conclusion of the enumeration, the Bureau will publicize the preliminary (hand tallied) population and housing unit counts for the smallest areas for which the summarizations can feasibly be made in the local field offices and again request intensive review by the local authorities.

This local review program is an important innovation of the 1980 decennial census. For the first time, 39,000 local government officials will have a formal opportunity to review counts both before and after the actual field work on the census and to communicate with the Census Bureau regarding possible errors in time for their information to affect the completeness of the count.

The Bureau is committed to reviewing all potential discrepancies uncovered in the review by local officials. However, in order for the Bureau to review comments or possible discrepancies and take corrective action where necessary, detailed supportive evidence from the local governments will be required for both the preenumeration and postenumeration review phases. It will not be feasible for the Bureau to recheck an area based solely on the feeling that a count seems too low or too high. Questions by the local

To Adjust or Not to Adjust

Given the financial and political ramifications of adjusting for census undercounts after the local review program is completed, it is little wonder that the undercount issue is so controversial. Consider, for example, the following problems:

- How adequate are the techniques for measuring the undercount?
- What options exist for adjustments relative to census population undercounts?
- What are the legal, philosophical, legislative, and political concerns involved in adjusting census numbers?
- Can an equitable formula be developed for adjusting figures in Federal fund allocation programs?
- What are the implications of adjusting census data for the Federal statistical system in general and the Bureau of the Census in particular?

An examination of this problem is presented by Nathan Keyfitz, "Information and Allocation: Two Uses of Census Data," *The American Statistician* vol. 33, No. 2 (May, 1978), pp. 49–50.

governments about possible problems with the counts should be raised at the lowest geographic level possible, that is, at the enumeration district or block level. Therefore, to conduct any independent detailed review of the precensus address counts or the preliminary population and housing counts, local governments will need to have small area data available so they can pinpoint the areas of possible discrepancies.

CHOOSING THE QUESTIONS

No part of the census planning is more important than the selection of questions that will result in the data that the user community needs. The Census Bureau itself is only a statistics-gathering agency; it does not operate programs that require particular data. Facts are not collected because the Census Bureau wants them but because of needs expressed elsewhere—by Federal Government agencies, State and local government users, demographers, public and special interest groups, etc.

In planning for the 1980 census, the Bureau consulted a broad spectrum of data users in an effort to ensure that the right questions are asked. From October 1974 to July 1975, local public meetings were held in 73 cities across the country to give the interested public an opportunity to critique the 1970 census and suggest improvements for 1980. In addition, regional meetings were held between November 1974 and December 1975 with top planning officials of 48 States. Suggestions on content were also gathered at three

FACTS ABOUT THE 1980 CENSUS

- Census Day for the Twentieth Decennial Census of Population and Housing will be Tuesday, April 1, 1980.
- The Census Bureau will count all persons in the Nation and all housing units. It is expected to cover approximately 222 million people residing in some 86 million housing units.
- Data will be compiled for:
  3,100 counties;
  20,000 incorporated villages, towns, and cities;
  35,000 county subdivisions;
  45,000 census tracts;
  275,000 enumeration districts;
  2,500,000 city blocks.
- One of the prime purposes of the census, as indicated in the Constitution, will be the same as during the first census in 1790: to provide the basis for fair apportionment among the States of seats in the House of Representatives.
- Census data also are used for the distribution of Federal funds to State and local governments, currently estimated at more than $50 billion a year, and for the distribution of additional billions of dollars in State funds.

meetings of users of machine-readable census data held in the same 1974–1975 period. Many users submitted recommendations by letter, and these were considered along with recommendations made during meetings.

Another important source of advice on the content of the 1980 census questionnaire was the Federal Agency Council on the 1980 Census, established by the Office of Management and Budget at the request of the Census Bureau. The Federal Agency Council, consisting of official representatives from over 90 Federal agencies that use decennial census data, held its first meeting in December 1974 and continued to meet intermittently throughout the census period. Nine subject-area working committees were set up to draft proposals for questionnaire content.

The Bureau's advisory committees were another important source of review of 1980 subject content. Three of these addressed minority concerns and provided suggestions on the "race," Spanish-origin, ancestry, and language questions, among others. There were also separate committees on population and housing content, and one committee representing the American Statistical Association.

Although in a few instances outside data users participated in formulating the exact wording of census questions, Census Bureau staff were primarily responsible for this aspect of census planning. Different wordings of certain questions were examined in a national test and in other test dress rehearsal censuses to see which produced the most reliable data. The feasibility of asking new questions was also tested.

Census planners were restrained from putting just any question on the questionnaire by several factors. First, a core of key items must be included for purposes of historical comparability and because of the continuing usefulness of the items. Second, questions asked must be in the broad public interest. Third, because of the concern for the burden placed on respondents there could not be a significant increase in the number of items asked. Finally, certain questions could not be asked because the public's perception of confidentiality might be impaired.

Title 13 of the U.S. Code, the Bureau's authorizing legislation, directs that the Secretary of Commerce "shall prepare questionnaires, and shall determine the inquiries, and the number, form, and subdivisions thereof, for the statistics, surveys, and censuses provided for in this title." Though primary responsibility for setting questionnaire content rests with the Secretary and by delegation of authority with the Director of the Census Bureau, the Bureau is required by the Federal Reports Act of 1942 to submit census questionnaires to the Office of Management and Budget for review. In addition, the Bureau is required by title 13 to advise Congress of subject items to be included in the census 3 years before census day, and 2 years before census day the Bureau must advise Congress of the actual questions to be used in the enumeration.

Questionnaires

Questions covering 7 population subjects and 12 housing subjects are asked of every household. These questions are asked of everyone because the data derived from them are needed for the tabulation of data to the smallest geographic areas. These data are often referred to as 100-percent or complete-count data.

The population items include: Name, relationship, age, "race," sex, marital status, and Spanish origin. Housing questions asked on a 100-percent basis include such items as number of rooms, number of units at address, and rent.

Questions That Won't Appear
(From letters to the Census Bureau)

Ask "Have you ever had an experience like knowing about another person's thoughts or like knowing of events far away... felt as though you were aware of someone else's thoughts when he or she was not with you and there was 'no way to know'?" If so, "Once or Twice, Several Times, Often, Don't Know, or Never In My Life." Or "Have you ever had what is popularly known as a 'paranormal' or 'psychic' experience?"

Ask for hobbies, and under a subentry for recreational time spent, ask about gardening so they can determine the effect on the purchasing of canned or frozen vegetables.

Determine supervisory relationships between parents and their kids of school age and find out how many are left unsupervised.

Ask the height and weight of the population on a 100-percent basis so they can determine the national obesity rate.

Include questions documenting the companion animal population. "In order for us to predict whether the public favors large or small dogs, or whether cat ownership is on the decrease..."

Ask how many people believe there is already insufficient wilderness to sustain adequate natural resources.

Ask on a National basis how many people suffer from hay fever.

Ask "Do you take vitamins and/or minerals to supplement your daily diet? "If you do not take vitamins and/or minerals, do you believe that for many people they do offer real health benefits?" "If you had your choice, would you choose a medical doctor who practices preventive health care, or one who engages in the normal practice of medicine?

Find out livestock and feed consumption per county.

Ask how many people smoke how many cigarettes per day.

The remaining questions dealing with some 26 population subjects and 20 additional housing subjects are asked of only a sample, or fraction, of the population. As mentioned in chapter 6, sampling techniques allow the Bureau to collect information on additional subjects while keeping the overall national reporting burden at a minimum.

About 79 percent of the households will be sent questionnaires containing only the 100-percent or complete-count items; these questionnaires are often called short forms. The remaining 21 percent of the households will be sent questionnaires that contain both the 100-percent and sample questions; these are called long-form questionnaires.

1980 Census Concept of Residence

The First Decennial Census Act approved on March 1, 1790, stated that persons were to be enumerated at their "usual place of abode"; that persons "without a settled place of residence" shall be counted "where he or she shall be" on census day; and that "every person occasionally absent at the time of the enumeration" shall be counted "as belonging to that place in which he usually resides." This concept of usual place of abode or residence is generally construed to mean the place where the person lives and sleeps most of the time. This place is not necessarily the person's legal residence, voting residence, or domicile.

Rules for counting persons whose usual place of residence is not immediately clear include:

Crews of the U.S. Navy vessels. In the 1970 census, crews of U.S. Navy vessels, excluding those deployed to the overseas fleet, were counted as living on board the ship and the entire ship's crew was counted as residents of the home port of the vessel. Since some members of the ship's crew may maintain a household in the home port, or in an adjacent city with their families, more equitable distribution of population counts for these areas might result if these crew members are counted as residents of the specific areas rather than aboard ship. Therefore, for the 1980 census, the crews of the vessels at selected home ports will be counted at their residences ashore if such residence is within 50 miles of the home port.

Agricultural workers in group quarters. In the 1970 census, agricultural workers living in dormitories or other group quarters at the time of the census were counted as residents of the camp where they were working. This practice was based on the assumption that such workers, in general, had no fixed residence in the United States. In response to inquiries about this practice, the Bureau conducted a special survey of migrant farmworkers covering a sample of 18 migrant worker camps in four States. The majority of the workers in these camps reported having a usual residence elsewhere. Therefore, for the 1980 census, agricultural workers in camps will be given the opportunity to report a usual place of residence elsewhere, and, if reported, the worker will be counted at that residence rather than the camp.

Other residency rules. Other residency rules will remain the same as in 1970. For example, members of the Armed Forces living on military installations in the United States are to be counted as residents of the area in which the installation is located; those living off the military installation are to be counted as residents of the area in which they are living. College students are to be enumerated as inhabitants of the localities in which they are living while attending college. Students who are away from home attending school below the college level, except those in institutional-type schools, are to be counted as residents of their parental household. Persons residing in institutions, such as penitentiaries, mental institutions, or homes for the aged, are to be counted as residents of the area where the institution is located. Persons with no usual place of residence are to be counted where they are staying at the time of the census (e.g., hotels, motels, YMCA's).

For the 1980 census, the Bureau has developed a differential sampling plan. In most areas, one household out of six will be asked the sample questions; but in legal entities (especially unincorporated places and minor civil divisions) under 2,500 population, one in two households will get the sample

Questionnaire Field Tests

Questionnaire content was field tested in the full-scale pretests, and dress rehearsals of the specific wording of questions was done in connection with the National Content Test, conducted by mail in 1976 with two national samples of about 14,000 households each. Alternative versions of questions on topics such as ethnic origin and disability were tested and a subsample of households was selected for a content reinterview. Other tests of census content included the Salem County, N.J. pretest census in 1975, the National Income Test in 1975, and the National Test on Spanish Origin in 1978. The Salem census and the income test were aimed at perfecting income questions, and the National Test on Spanish Origin was used in conjunction with the results of the dress rehearsal censuses to finalize the question on Spanish/Hispanic origin or descent.

inquiries. The 50-percent sampling scheme for smaller areas is being employed so that income data (from sample population items 32 and 33) will be reliable for even the smallest of revenue-sharing entities. As a related benefit for data users, reliable statistics on the other four sample subjects will also be prepared for these small governmental units.

The decision to use this type of sampling procedure will benefit the census data user in at least three ways. First, short-form data are processed first to expedite release of population counts and other basic data. Long-form data take longer, in part because of the time requirements for coding of write-in entries. Thus, short-form data will be available 8 to 12 months earlier than corresponding long-form data. Second, the long-form data will be reported as estimates based on a sample, they will not be as precise as the complete counts available for short-form questions. Finally, because of sampling variability, questions asked only on the long-form are not reported at the block level at all.

1980 Content Items

Each item appearing on the 1980 census questionnaire is discussed below in terms of change since 1970, a brief history of the item, some of the instructions to respondents or enumerators, and a few of the uses that the data serve. First discussed are the 100-percent population items, followed by sample population items, 100-percent housing items, and sample housing items.

Population Items: 100 Percent

P1. Name. Space is provided on page 1 of the questionnaire for respondents to list the name of each person who usually lives in the household, and detailed guidelines are provided that describe whom and whom not to list.

The name(s) is to be written at the head of the seven "persons" columns on the population pages inside the questionnaire. (There were eight such columns in 1970.) If there are more than seven persons in a household, an enumerator will visit the housing unit and put information for the remaining family members on a continuation questionnaire. Names of all individuals have been collected in each census since 1850; from 1790 to 1840 only the names of family "heads" were gathered. Names are collected for control purposes and to guard against counting the same person twice. The names, as well as the addresses, are kept strictly confidential and are not placed on computer tape.

P2. Relationship. An important difference in the 1980 form over the 1970 form is the concept of householder. The 1970 census asked for one person to be listed as the head of household, and since the second category was listed as "wife of head" there was the clear implication that only the husband could be "head" in a husband/wife family.

The years since 1970 have brought increased awareness of the undesirable impact of such sexism. Therefore the concept of household head has been eliminated. The Census Bureau still needs to identify a single reference person so that relationships of other household members can be unambiguously specified. As far as the census form is concerned this reference person is merely referred to as the "person in column 1." The instructions direct that person be the household member (or one of the members) in whose name the home is owned or rented. If there is no such person in the household, any adult household member may be listed first. In tabulations, this reference person, the person in column one, is referred to as the "householder."

The question on household relationship is important in developing data on families and household types. The first set of categories are for persons related to the householder—these persons together constitute a family. All others are unrelated individuals. If all persons in a household are unrelated to the householder, we call it a "nonfamily household."

If the householder is married and his or her spouse is present they will be called a married-couple family. Even though the question is being asked in a different way, 1980 data on married-couple families should be completely compatible with 1970 data for what were then called husband/wife families.

P3. Sex. A question on sex has been asked in every census.

P4. "Is this person . . ." When the Census Bureau talks about race it is not denoting any scientific identification of biological stock. Rather it reflects self-identification by the respondent. Since the 1980 census will obtain information primarily through self-enumeration, the data represent essentially

Sex

Federal program uses: Statutory requirements for these data include the Comprehensive Employment and Training Act of 1973 and the 1974 Amendments to the Elementary and Secondary Education Act of 1965. Programs using data on sex include Aid to Families with Dependent Children (AFDC), the Women's Special Employment Assistance Program, and the Minimum Wage and Hours Program.

Federal laws:

20 U.S.C.

241c Determination of education grants

1322(c)(1) Policies and procedures for allocation of funds for residential vocational facilities

1866(d),(e) Research grants, Women's Educational Equity Act of 1974

29 U.S.C.

848(b),(f) Prohibition of discrimination and equitable distribution of opportunities, CETA

881(a),(c) Research and evaluation program, CETA

983(1) Prohibition against discrimination, CETA

31 U.S.C.

1242(a) Nondiscrimination provision, general revenue sharing

42 U.S.C.

Chapter 21 Civil Rights

601, 603(a) Aid to Families with Dependent Children

1773(c) Fund disbursement; school breakfast program

2000c Public education

2000e Equal Employment Opportunities

2812(a) Allotment of funds for community action programs

2812(b) Criteria for fund allotment to urban and rural community action programs

5306(a) Allocation of funds from the Community Development Act of 1974

Federal agency users:

Department of Health, Education, and Welfare

Department of Housing and Urban Development

Department of Labor

Department of Treasury

Community Services Administration

Education Division, DHEW

Equal Employment Opportunity Commission

Office for Civil Rights, DHEW

Social Security Administration

Other uses: State and local governments use data on sex to implement affirmative action programs and to form and implement welfare and service programs. Social scientists and market analysts also rely heavily on these data.

self-classification by people according to the race with which they identify themselves.

In 1970 question 4 was labeled "Race"; however, in the last decade there was a growing awareness of the fact that this question contains categories that do not fit the classical definition of "race." Thus the neutral lead-in "Is this person..." is being used in 1980. The 1970 category of "Negro or black" is now "black or Negro" reflecting the prevalency of the term "black" in the 1970's. Several new categories have been added ("Vietnamese," "Asian−Indian," "Guamanian," and "Samoan") in response to data requirements of recent Federal legislation, and the categories "Eskimo" and "Aleut" appear on all questionnaires, whereas in 1970 they appeared only on questionnaires used in Alaska. American Indians and those marking "Other" are asked to write in either their tribe or other specific identity. The race of a person's mother is entered by enumerators for those who are unable to provide a single response. Questions on "race" or "color" have been asked in each census since 1790. Racial data provide the basis for implementing equal opportunity, affirmative action, and some employment legislation and are essential to much social science research.

P5. Age and Month and Year of Birth. Age has been asked in each census since 1790.

P6. Marital Status. Marital status data are tabulated only for those 15 years and older, a change from the period 1940 to 1970 when they were tabulated for persons 14 years old and over. Those persons whose only marriage has been annulled are instructed to mark "Never married," as in previous censuses. A general marital status question has been asked in every census since 1880. From 1850 to 1890, respondents were asked if they had been married during the year. A series of marital history questions are also asked on the sample questionnaire (items 21a, 21b, and 21c).

P7. Spanish/Hispanic Origin or Descent. Spanish identification is different in 1980 from that in 1970 in two important respects. First, there is a single item defining the Spanish population using self-identification. In 1970 there was a similar item on one type of questionnaire, but for most purposes the definition depended on more "objective" measures involving mother tongue and country of origin of first- and second-generation immigrants. Self-identification has proved to be more satisfactory and is now used exclusively. Second, the Spanish-origin question is on the complete-count questionnaire in 1980 whereas in 1970 Spanish-origin data were derivable only on a sample basis. This means that 1980 data on the Spanish population will be available sooner and can be reported in the *Block Statistics* reports.

Various wordings of this question were tested for use in 1980, and the final arrangement and wording of the categories are different from the 1970

[illegible]

[illegible]

1. Definitions. The basic racial and ethnic categories for Federal statistics and program administrative reporting are defined as follows:

a. *American Indian or Alaskan Native.* A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.

b. *Asian or Pacific Islander.* A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Phillippine Islands, and Samoa.

c. *Black.* A person having origins in any of the black racial groups of Africa.

d. *Hispanic.* A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.

e. *White.* A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

2. Utilization for Recordkeeping and Reporting. To provide flexibility, it is preferable to collect data on race and ethnicity separately. If separate race and ethnic categories are used, the minimum designations are:

a. *Race:*

American Indian or Alaskan Native;

Asian or Pacific Islander;

Black; and

White.

b. *Ethnicity:*

Hispanic origin; and

Not of Hispanic origin.

[illegible]

If a combined format is used to collect racial and ethnic data, the minimum acceptable categories are:

American Indian or Alaskan Native;

Asian or Pacific Islander;

Black, not of Hispanic Origin

White, not of Hispanic Origin

[illegible]

[illegible]

Displays of racial and ethnic compliance and statistical data will use the category designations listed above. The designation "nonwhite" is not acceptable for use in the presentation of Federal Government data. It is not to be used in any publication of compliance or statistical data or in the text of any compliance or statistical report.

In cases where the above designations are considered inappropriate for presentation of statistical data on particular programs or for particular regional areas, the sponsoring agency may use:

(1) The designations of "Black and Other Races" and "All Other Races" as collective descriptions of minority races when the most summary distinction between the majority and minority races is appropriate;

(2) The designations "white," "black," and "All Other Races" when the distinction among the majority race, the principal minority race, and other races is appropriate; or

(3) The designation of a particular minority race or races, and the inclusion of "Whites" with "All Other Races," if such a collective description is appropriate.

In displaying detailed information which represents a combination of race and ethnicity, the description of the data being displayed must clearly indicate that both bases of classification are being used.

When the primary focus of a statistical report is on two or more specific identifiable groups in the population, one or more of which is racial or ethnic, it is acceptable to display data for each of the particular groups separately and to describe data relating to the remainder of the population by an appropriate collective description.

Source: *Federal Register*, Vol. 43, No. 87 (May 4, 1978), pp. 19269.

[illegible]

If a person cannot select a single group, the enumerator is instructed to mark the category "Yes, other Spanish/Hispanic," if all parts of the person's ancestry are Spanish (e.g., "Cuban-Mexican"), but to mark "No, not Spanish/Hispanic" if only one part of the ancestry is Spanish (e.g., "[illegible]").

[illegible]

Education. The 1980 questions are basically the same as those used in 1970, but with some modifications. The categories of item 8 have been reworded to avoid some of the confusion that resulted in 1970. The 1970 response "Yes, parochial" has been changed to "Yes, private, church-related." Item 9 carries the new instruction that those persons who have passed a high school equivalency examination (such as GED) are to mark "12" under the years of school completed (if they had not completed or were not enrolled in a higher grade). School enrollment data for individuals have been collected in each census since 1850, and questions on the years of school completed have been asked in censuses since 1940, replacing the literacy question, which had been asked since 1840.

School Enrollment

Federal program uses. Enrollment data are used by the executive and legislative branches of the Federal government for policy research. Agencies within the Department of Health, Education, and Welfare that use school enrollment data from the census for program planning and implementation are: The Office of the Assistant Secretary for Education, the Office of the Assistant Secretary for Planning and Evaluation, the Bureau of Occupational and Adult Education, the Bureau of Education for the Handicapped, the Bureau of Postsecondary Education, and the Office of Child Development.

Federal laws:

20 U.S.C.

880b-1 Bilingual Education Act

1221e-1(b)(1) National Center for Education Statistics report on the condition of education in the United States

1323(b)(1) Special consideration in use of funds; Residential Vocational Education Facilities

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] of Postsecondary Education

Congressional Budget Office

Congressional Research Service

Education Division, DHEW

Federal Highway Administration

National Center for Education Statistics

Office of Child Development

Other users. Although enrollment data are available from public school systems, the census is the only uniform source of data which shows school enrollment levels by age, sex, race, income, and other characteristics for all enrolled children, and similar data for school-aged children not enrolled in school. Research organizations, such as the American Council on Education and the RAND Corp., and State and local governments use these data to determine the need for the location of educational facilities and to identify population groups with particular needs or skills levels.

P11. Place of Birth. Place of birth data have been collected in each census since 1850. Answers to this question are used to classify the population by "native" or "foreign born." The native population are those persons born in the United States, Puerto Rico or other outlying areas, at sea, or in a foreign country, if they have at least one American parent. Statistics on State of birth provide data on internal migration between time of birth and date of the census.

P12. Citizenship and Year of Immigration. These questions, which apply only to persons born in a foreign country, [illegible]

A citizenship question was asked in the census in [illegible] and 1970. A year of immigration question was asked from [illegible] and in 1970.

Information on citizenship is used to classify the population into the two major categories of citizens and aliens, and citizens are further classified as native or naturalized. One use of citizenship data is to measure participation rates for eligible voters. The census question on citizenship does not attempt to determine the legal status of aliens.

P13. Current language. In 1970 a question was asked on "mother tongue": "What language, other than English, was spoken in this person's home when he was a child?" The focus of the language question for 1980 is on current language rather than on "mother tongue," which represents a significant departure from previous censuses. Part c of this question was added at the request of Federal agencies that need to know the number of people who have difficulty with English.

P14. Ancestry. The 1980 census is the first in which a general ancestry question has been asked. This question replaces those about the places of birth of a person's parents, which in combination with the place of birth question provided data on first- and second-generation Americans. This new question asks the ancestry of all Americans, no matter how many generations they have been in this country. Persons who are of more than one origin and who cannot identify with a single group are instructed to report a multiple ancestry, e.g., German—Irish. Instructions also specify that a religious group should not be reported as a person's ancestry.

P15. Residence 5 Years Ago. This item was asked on the 14-percent sample in 1970 (there was also an abbreviated question on "residence 5 years ago, on the 1970 5-percent sample), and it will be used in conjunction with residence in 1980 and State of birth to determine the extent of residential mobility of the population. Persons in college or in the military on April 1, 1975, are instructed to report their place of residence there. Similar questions have been asked in each census since 1940, but the 1950 question asked for residence in the preceding year.

P16. Continuation Question. Persons born after April 1965 and who are thus under 15 years old do not have to answer the questions that follow on employment, occupation and industry, disability, marital history, transportation to work, and income. In the 1970 census, the cutoff age was 14.

P17. Activity 5 Years Ago. This question, asked for the first time in 1970, is used to measure labor mobility for selected population groups. Unlike 1970, there are responses under "Working at a job or business?" for both full-time and part-time workers. Respondents are instructed to mark "Yes" for each activity in which they are involved.

P18. Veteran Status. For 1980 this question is designed, for the first time, to pertain to women as well as men. The number of categories for the period

Sample Ancestry Related Items

Several sample questions provide useful information on ancestry. Question 14 will be a write-in question to which the person can respond with the ancestry group with which he or she identifies (e.g., English, Polish, or American). The new self-identification approach recognizes that strong ethnic identity is not limited to just first- and second-generation immigrants. First-generation immigrants can still be identified with separate questions on country of birth (Question 11) and year of immigration (Question 12b). Persons born in a foreign country are asked whether or not they are now citizens of the United States (Question 12a). There is, however, no attempt to determine from noncitizens whether their residence is legal or documented. Finally, all persons are asked if they speak a language other than English at home, and if so, to specify that language and to indicate how well they speak English (Question 13). In census reports and tabulations these data will be separately reported for school-aged children and for adults because these data will serve as important indicators of the need for services such as bilingual education.

served has increased from five to seven. The question is also asked of a larger sample than in 1970, when it was asked on a 15-percent basis. A question on military pensioners was asked in 1840, questions on Civil War veterans in 1890 and 1910, and a veteran status item has been included in every census since 1930. It has only been since 1960 that detailed data on veteran status have been published. These data are put to a variety of uses by the Veterans' Administration and by veterans' organizations.

P19. Disability. This question differs in several respects from the 1970 item. First, it is asked of a much larger segment of the population; in 1970 it was only a 5-percent item. Second, it may be used as a screening device to identify disabled persons for a follow-up survey to be conducted after the census. Third, in addition to asking about work disability, it also asks if a person is limited or prevented from using public transportation. Fourth, it includes in the disability universe those persons who have a mental condition as well as those with physical or health conditions. Finally, the 1980 question does not obtain detailed data on duration of the disability, as in 1970, but is restricted to those who have had a disability condition for 6 months or more. Questions on disability were included in the censuses of 1880 and 1890, but the 1970 census questionnaire was the first in this century to contain such an inquiry. This question will provide data on the size and distribution of the disabled population and aid Federal, State, and local agencies responsible for developing programs to serve the handicapped.

P20. Number of Children Ever Born. This item, which is the same as the 1970 question, is an important source of data for determining current and future trends of population growth, fertility rates, projections of the future age of the population, etc. A similar question has been asked in each census since 1890, except for 1920 and 1930.

P21. Marital History. This question is the same as that used in 1970, when it was asked only on the 5-percent sample. Data on current age and answers to this question will be used to derive age at first marriage. Various questions on marital history have been asked since the 1850 census, and the question on how the first marriage was ended was added in 1970.

P22, P25, P26, and P27. Employment Status. Though monthly labor force data for large areas are collected on the Current Population Survey, the census is the only source of comprehensive and detailed employment data for small areas, e.g., counties, cities, and parts of cities. As in 1970, most data published will be for those 16 years old and over to achieve conformity with the official measurement of the labor force; in 1940, 1950, and 1960, labor force data were published for those 14 years old and over.

Item 22 asks if a person did any work the previous week (the calendar week before respondent completed the questionnaire) and how many hours the person worked. In 1970 eight categories of hours worked were given and respondents were supposed to mark one; for 1980, respondents are instructed to write in the exact number of hours worked. Questions 25, 26, and 27 are essentially the same as the 1970 questions, except for minor changes in wording. Employment status questions were asked on a supplemental questionnaire on unemployment in 1930 and have been asked in each census since 1940.

P23 and P24. Place of Work and Journey to Work. The place-of-work question was on the 15-percent sample in 1970. As in 1970, persons are instructed to give the exact street address of their place of work. In addition, those persons who do not know the exact address of their workplace are instructed to write a physical location description. When the place-of-work question was first asked in 1960, only city, county, and State were obtained. Data on means of transportation to work have been collected since 1960, but in 1980, questions on commuting time (24a) and carpooling (24c and d) are also included. If people use more than one method of getting to work, they are instructed to give the method usually used for most of the distance. The categories have been expanded to include trucks, vans, motorcycles, and bicycles.

Data from these questions constitute the basic information used by the Department of Transportation to appraise transportation plans, monitor transportation system efficiency, plan for new energy efficient transportation options, and evaluate proposals from States and local areas for Federal aid. They are also extensively used by State and local transportation planners.

P28, P29, P30. Industry, Occupation, and Class of Worker. These questions are basically the same as in 1970. If a person did not have a job or business the previous week, information should be given on the person's last job or business in the previous 5 years; in 1970, information was to be given on the last job within the previous 10 years.

On the occupation question, persons were asked to give their job title in 1970, but that part of the question was dropped for 1980.

Data on occupation and industry are used to describe the work activity of the American labor force and to formulate policy and programs for employment, manpower, development, and training.

Data on occupation were collected in 1820 and 1840, and have been collected in each census since 1910. Also a class of worker question has been asked in each census since 1910.

P31. Work and Weeks Looking for Work in 1979. Parts c and d of this item are new for 1980. On part b, respondents are asked to write in the number of weeks they worked, whereas in 1970 they were to mark one of six categories.

Data on work, in combination with earnings data (item 32), are used to estimate hourly and weekly wage rates, to indicate whether earnings are included in total income, and to control for differences in work input when making income and earnings comparisons among various groups.

Forerunners of this question have been asked in each census since 1880.

P32 and P33. Income. A question on total income received during the previous year has been added. In order to get complete reporting of income, the questionnaire asks income amounts from each of seven different sources: wages and salaries; own business (other than a farm); own farm; interest and dividend income; social security; public assistance or welfare; and other (e.g., alimony, unemployment compensation). As a double check on accuracy and completeness the person is asked to add up the figures and separately report the total.

Derived Variables

Some variables appearing in census reports do not appear, as such, on the questionnaire. Poverty status, density, and families serve as examples. Poverty status, for instance, is a variable derived by interrelating family income with the number of persons in the family and the age of the householder. A series of income thresholds have been established in a standard Federal definition of poverty. The poverty thresholds are adjusted every year by the consumer price index to make comparisons between 1980 and 1970 valid even while the incomes have been increased by inflation. If a household consists of persons not related by blood or marriage, each person's poverty status is determined independently even though the persons may pool their income for household expenses.

Income may well be the single most important topic on the sample questionnaire. In fact, it was specifically because income data were needed for all governmental areas for Federal allocation formulas and because the one-in-six sample would not provide data of sufficient reliability for small governmental areas that the 50-percent sampling rate was arrived at for counties, municipalities, towns and townships with fewer than 2,500 inhabitants. Income questions have been asked on each census since 1940.

Housing Items: 100 Percent

H1, H2, H3, H4. Coverage Questions. The first three of these questions are designed to assure that a complete and accurate roster of persons is obtained for each household. The fourth is also a coverage question; the number of units reported by a respondent is compared with the number of units recorded for an address in the Bureau's address register, and if the former figure is higher, a field check is conducted. Combinations of these questions have been asked in each census since 1960.

Housing Unit Definition

A housing unit can be a house, an apartment, a mobile home, or under certain conditions, even a single room, houseboat, or recreational vehicle. The occupants may be a single family, one person living alone, two or more unrelated persons who share living arrangements, and so forth. Both occupied and vacant housing units are included in the housing inventory, except that boats, recreation vehicles and the like are included only if they are occupied as someone's usual place of residence.

College dormitories, homes for the aged, military barracks, and other living quarters containing 10 or more persons unrelated to the persons in charge are not counted in the housing inventory, and are instead counted as group quarters. Homes still under construction, burned out, or otherwise unable to be lived in, and any nonresidential buildings are also not included in the housing tabulations.

H5. Access to Unit. Living quarters must have direct access from the outside or through a common or public hall to be considered separate housing units. This item has been asked in each census since 1960.

H6. Complete Plumbing Facilities. Three separate 1970 items on water supply, toilet facilities, and bathing facilities are combined for 1980 into the complete plumbing facilities question. The items were combined in part to save space on the questionnaire and in part because units without plumbing facilities are now a small part of the national inventory and there was little demand for separate items. Asked on every census since 1940, this item is used in combination with others as an indicator of housing quality.

H7. Number of Rooms. Collected in each census since 1940, the number of rooms in combination with the number of persons living in a unit provide a

Complete Plumbing Facilities

Federal program uses. The lack of complete private plumbing facilities is an important indicator of what is generally accepted to be substandard housing. As such, it is one of the data items in the "substandard" component of the Housing Assistance Plan (HAP) which must be filed with the Department of Housing and Urban Development as a condition for receiving community development block grants. Guidelines for HAP submission were developed in response to section 104(a)(4) of the Housing and Community Development Act of 1974. Counts of units lacking complete plumbing are used in reports required of Federal agencies by legislation such as the Housing Act of 1937; the Housing Act of 1949; the National Housing Act; and the Housing and Urban Development Act of 1968.

Federal laws:

12 U.S.C.

1715 Statistical and economic surveys

42 U.S.C.

1437c Annual contributions for low-income housing projects

1437f Lower income housing assistance

1441 Congressional declaration of national housing policy

14[illegible]c Annual reports of the President to the Congress, contents

1476(c) Research, study, and analysis of farm housing

4501 Development of national urban growth policy

4503 Urban growth report

5304(a) (4)(A) Procedures for award of grants: Applications; contents; statements of assurances

Federal agency users:

Department of Agriculture (USDA)

Department of Housing and Urban Development

Other uses. State and local officials use data on the lack of private plumbing facilities to identify areas requiring rehabilitation or renewal.

ratio of persons-to-rooms, which is used to determine conditions of crowding. Only whole rooms used for living purposes are to be counted.

H8 and H9. Tenure and Whether Part of a Condominium. The elements of these two questions were combined in 1970. A fourth category under "Are your living quarters..." on cooperative or condominium ownership was pulled out with the intent of asking separate questions about condominiums and cooperatives. Because of misreporting on cooperative ownership, the question (H9) asks only about condominiums.

The tenure question provides data on owner-occupied and renter-occupied units that are basic to most housing analysis. A question on tenure has been asked in each census since 1890.

H10 and H11. Description of Property and Value. The property question is a screening device for delineating those housing units for which the value question (H11) should be asked. Thus the value question is asked only for owner-occupied one-family dwellings or condominium units without excessive land or commercial or medical activities on the premises that would distort the value of the property. Home value data are a major element in pinpointing areas of "substandard" housing, and have been collected in each census since 1930. There are 24 value categories for 1980, compared to 11 in 1970, and the terminal category is now "$200,000 or more," up from "$50,000 or more" in 1970.

H12. Monthly Rent. The number of rent payment categories has been increased from 14 in 1970 to 24 in 1980, and the highest category has been raised from "$300 or more" to "$500 or more." The 1970 question carried space for writing in the exact monthly amount and for writing in the amount and period of time covered if the rent was not paid by the month, but neither of these spaces appear on the 1980 question. This question has been asked in each census since 1930 and is important to various kinds of housing market analyses.

C1, C2, C3, and D. Vacancy Status. Enumerators fill out these questions and are instructed to get information from a reliable respondent such as a rental agent, building manager, or neighbor. The question, "Is this unit boarded up?" is new for 1980 and is designed to get information on units that are not in use but could be converted to use. Vacancy status data have been asked in each census since 1940 and questions on duration of vacancy, since 1960.

Sample Housing Items

H13. Description of Building. The category of "A boat, tent, van, etc." is new for 1980, replacing a write-in space for "Other" types of shelter. A one-family house is detached if there is open space on all sides, or the house is joined only to a shed or garage. "Attached" means that the house is joined to another house or building by at least one wall that goes from ground to roof. If a mobile home or trailer has had one or more rooms added to it, it is to be categorized as a one-family detached house. Item H4 asks for the number of units at an address, but since there can be more than one street address for the same building, answers to H4 and H13 are not necessarily related; furthermore, H4 is designed primarily as a coverage item and H13 provides the basic physical description of the housing inventory. Data on the number of units in a building have been collected in each census since 1940 and data on mobile homes since 1950.

Housing Quality Measures

Many people look to census data to define substandard housing. The 1980 census does present data on the number of units without complete plumbing and the number of units occupied by more persons than there are separate rooms, but neither of these measures are entirely adequate as indicators of housing quality. Users sometimes draw certain inferences about quality from the number of units with conspicuously low value or rent. In hot areas of the country the absence of air conditioning, and in cold areas the absence of permanent heating equipment are other census variables which may suggest inadequate housing. In any case, these statistical variances are at best only approximations to housing quality, although they are frequently used as such in the absence of better data.

H14. Stories in Building and Presence of an Elevator. Collected on a 5-percent basis in 1970, this item has been changed only slightly for 1980. The query on whether there is an elevator in the building, asked only of buildings with four or more stories in 1970, is now asked about all buildings. A basement or attic with finished rooms for living purposes is counted as a story. These data are used, among other things, to analyze the availability of housing for the handicapped and the elderly and were first collected in 1960.

H15. Farm Residence. This item is used to classify the U.S. population and housing inventory by farm–nonfarm residence. The definition of a farm has been changed. In 1970 a farm was a place of less than 10 acres with $250 or more in sales of farm products or a place of 10 acres or more with sales of $50 or more. A farm in 1980 will be any place (without an acreage limitation) with sales of farm products of $1,000 or more. The information on acreage is included to bridge the gap between the old and new definitions. Farm residence data have been collected in each census since 1890, and data on acreage and sales of farm products were first gathered in 1960.

H16 and H17. Source of Water and Sewage Disposal. Questions on source of water and sewage disposal, first asked in 1960, were on the 15-percent sample in 1970. There are 1980 categories for both drilled and dug wells, whereas in 1970 there was one category for individual wells. The resulting data are of interest to public health officials and to others concerned about the need for water purification, treatment, or sewage facilities.

H18. Year Built. The 1980 version of this question, which has been asked in each census since 1940, has seven categories instead of six, as in 1970, but otherwise it is the same as the 1970 question. This item provides data on the age of the housing stock and is one of the items often used as a housing quality indicator.

H19. Year Present Occupant Moved into this House. Asked on the 15-percent sample in 1970, this item is basically unchanged except for a reduction in the

Farm Residence Measures

In rural areas of the country, farm residents are an important population to identify. This is done by means of two questions in the housing portion of the questionnaire. Question H15a asks if the building is located on a city or suburban lot or on a place of less than one acre in size. If that is not the case, the respondent is asked (Question H15b) to estimate the sales of crops, livestock, and other farm products from that place. If those sales amount to $1,000 or more the place is considered to be a farm, regardless of how the residents may answer any other questions with regard to occupation, industry, or primary source of income. Thus, it is important to distinguish between the number of farms, the number of farmers (derived from the occupation question), and the number of persons employed in agriculture (derived from the industry question).

number of categories from eight to seven. The question appeared on the population pages in 1970 and was asked of each person; for 1980 it has been placed on the housing pages and pertains to the person in column 1. Respondents are instructed to mark when the person (in column 1) last moved into his or her present residence. Data from this question provide information on residential stability and identify areas with a high turnover. This question was first asked in 1960.

H20. Heating Equipment. A question on heating equipment has been asked on each census since 1940. Some minor changes in the categories have been made for 1980; "electric heat pump" has been added, and the write-in space for describing unlisted types of heating equipment has been dropped. These data are helpful in measuring standard of living, determining patterns and trends in the type of equipment used, and anticipating the need for new power plants, gas pipelines, or electricity transmission lines.

H21. Fuels. This item was asked on the 5-percent sample in 1970. Questions on heating and cooking fuel have been asked in each census since 1940, and a question on the type of fuel used to heat water was first asked in 1960. Like the previous question, data from this item are used to determine the need for new power facilities. They are also important in defining patterns of fuel usage and in planning air-pollution control activities.

H22. Cost of Utilities and Fuels. This question is essentially the same as the one used in 1970. Note that respondents are instructed to report the *average monthly* amount for the past 12 months for electricity, and the *total* amount for the past 12 months for water and other fuels. They are also instructed that if gas and electricity are billed together, to enter the combined amount on the electricity line and to bracket the two utilities. The costs for utilities and fuels have been asked in each census since 1940 and together with monthly rent provide gross rent data, which are used to determine "fair market rentals." Data on these costs are also important in studying the adequacy of income in relation to basic household costs.

Heating Equipment

Federal program uses. The Department of Housing and Urban Development requires local communities to supply this information to be used in applying for grants authorized by the Housing and Community Development Act of 1974, the Housing Act of 1949, the Housing and Urban Development Act of 1968, and others.

Federal laws:

42 U.S.C.

1437c Annual contributions for low-income housing projects

1437f Lower income housing assistance

1441 Congressional declaration of national housing policy

1441c Annual reports of the President to the Congress, contents

1476(c) Research, study, and analysis of farm housing

4501 Development of national urban growth policy

5304(a)(4)(A) Procedures for award of grants: Applications, contents, statements of assurances

7135 Establishment of Energy Information Administration

Federal agency users:

Department of Agriculture

Department of Energy

Department of Housing and Urban Development

Energy Information Administration

Other uses. These data are used by government and industry in studies to determine the need for additional facilities such as generating plants, long distance pipelines for oil or natural gas, and long distance transmission lines for electricity. These data are used as a measure of the safety of the equipment and a measure of the level of living, particularly when related to the local climate condition. The extent to which electricity is used for high kilowatt purposes, such as heating, is distinctly important in planning for an adequate supply of power. Data from these items provide an important measure of the changes in fuel use over the decade.

H23. Complete Kitchen Facilities. This was a 100-percent item in 1970. For 1980 it does not distinguish between the availability of kitchen facilities "for this household only" or "also used by another household," as the 1970 item did. A question on complete kitchen facilities was first asked in 1970, but questions on refrigeration were asked in 1940 and 1950, on kitchen sinks, 1940 and 1950, and on cooking facilities, 1960. Kitchen facilities data are used with other housing information to identify areas on low quality housing and to plan nutrition programs such as "meals on wheels."

H24. Number of Bedrooms. In 1970 the bedroom question was on the 5-percent sample. Data on bedrooms have been collected in each census since 1960 and when cross-classified with rent or value provide a standardized basis for evaluating the cost of shelter. In addition, the item is used as an indicator of housing adequacy when measured against occupant characteristics.

H25. Number of Bathrooms. Three 1970 categories have been collapsed into one category—"2 or more complete bathrooms"—for 1980, but otherwise the question is identical to the 1970 version. Number of bathrooms was asked on a 15-percent basis in 1970. A question on number of bathrooms has been asked since 1960 and the data, in conjunction with other housing information, are an indicator of housing quality.

H26. Telephone. In 1970 this question, collected on a 100-percent basis, asked if the household had a telephone on which it could be called, whether it was in another unit, in a common hall, or building, and the respondent was asked to provide the number. The question served primarily to facilitate telephone contacts by enumerators. In 1980 respondents are asked only whether they have a telephone in their living quarters. The question is included to obtain information on the extent to which disabled and elderly persons have access to telephones, among other reasons. (As an aid to the enumeration, respondents are asked to write their telephone numbers on the back of the questionnaires.)

H27. Air Conditioning. The air conditioning item was asked on the 15-percent sample in 1970. A similar question has been included in each census since 1960, and the data are used as a measure of housing quality and energy requirements.

H28 and H29. Automobiles, Vans, and Light Trucks. An automobile question has been asked on each census since 1960, and was a 15-percent sample in 1970. The question on vans and trucks is new for 1980. Respondents are instructed to count company cars kept at home and used by household members, but they are not to count vehicles permanently out of working order. Data from these questions are used for transportation and parking planning and in energy consumption and air pollution studies.

H30, H31, and H32. Shelter Costs for Homeowners. These questions are new for 1980 and are included at the request of a number of Federal agencies. These data will be of use for Federally mandated housing programs, in energy studies, in shelter studies for the elderly and handicapped, and in estimating the national wealth. They will also be of value in connection with State and local housing planning, the study of household expenses, and similar activities.

SUMMARY

Planning for the 1980 decennial census began immediately upon conclusion of the 1970 census period with a review of recent census experience, the scheduling of key activities, and budget proposals. The Census Bureau undertook a large-scale effort to collect information from all segments of the American society as to their data needs and their recommendations for the 1980 census. Plans were then made to address the dual purposes of census taking today: To provide information for allocation and analysis. After more than 6 years of preparation, the actual conduct of the 1980 decennial census will begin on April 1, 1980. The ultimate success of the enumeration process will depend upon the Census Bureau's ability to enumerate all residents of the United States. How that process will work is the subject of chapter 9.

Recommended Readings

Keyfitz, Nathan, "Information and Allocation: Two Uses of the 1980 Census," *American Statistician*, Vol. 33, No. 2 (May 1979), pp. 45-50.

National Research Council, *Counting the People in 1980: An Appraisal of Census Plans* (Washington, D.C.: National Academy of Sciences, 1978).

Chapter 9

COLLECTION AND TABULATION

INTRODUCTION

By the time the 20th Decennial Census of Population and Housing is finished approximately 222 million people living in 86 million housing units will be enumerated. April 1, 1980 publicly marks the beginning of the 1980 decennial census that concludes 9 months later when, by law, the counts are delivered to the President of the United States. The enormity of this task draws upon many resources within the Census Bureau, but the primary responsibility for the enumeration is assigned to the Census Bureau's Field Division. The Field Division maintains a headquarters staff at Suitland, Md. and also operates 12 permanent regional offices located in Atlanta, Boston, Charlotte, Chicago, Dallas, Denver, Detroit, Kansas City, Los Angeles, New York, Philadelphia, and Seattle (see fig. 2-4). For census-taking purposes, however, these 12 regional offices have opened regional census centers that are charged with the direct responsibility for data collection. Finally, under the general direction of the regional census centers are 409 temporary district offices.

The objective of this chapter is to provide an in-depth examination of the overall plans for the 1980 data collection effort, the district office staff, and the operations they carry out. The chapter is divided into four sections: The mythical Smiths, preparing for the Census, taking the Census, and closing out the Field Operations.

THE MYTHICAL SMITHS

Recently, the Director of the Bureau of the Census, Vincent P. Barabba, used the example of the mythical Smith family to illustrate the enormity of the Bureau's decennial census requirement to contact 86 million households (approximately 222 million people).[1] Part of the Director's statement, a nontechnical explanation of how the decennial census will affect the average family, is quoted below.

I would like to illustrate census operations by reference to the mythical Smiths of Atlanta, Ga., an average urban family. The fact that they live in Atlanta really doesn't matter nor does their race, income, or type of dwelling. The census will touch them a number of times, sometimes without their being aware of it.

One hundred percent of the households will be mailed a questionnaire to arrive at their homes March 28, 1980. About 90 percent of the population will be asked to fill out the form and mail it back. For the balance of the population, primarily located in rural areas, census enumerators will pick up the completed questionnaires by the traditional door-to-door visit.

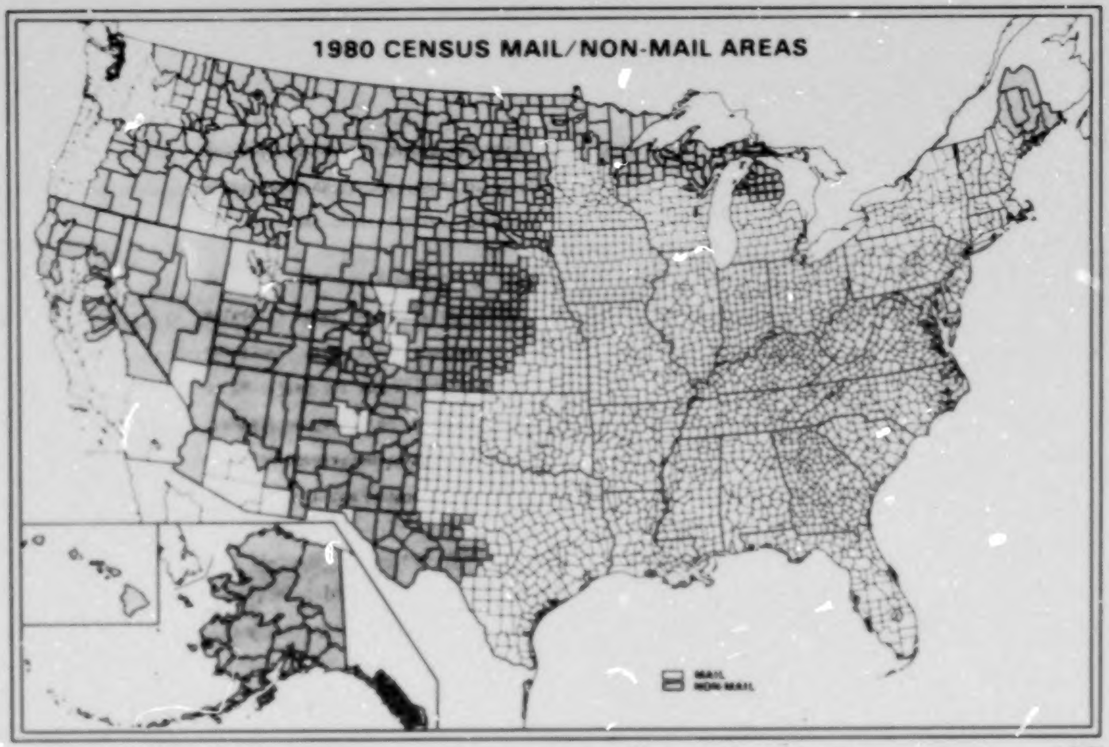
Since the Smiths live in an urban area, a mail-out/mail-back area, their address will probably be on one of the commercial mailing lists purchased by the Bureau. The addresses on these lists are checked several times by the Postal Service and then, prior to the mailing of the questionnaire a census enumerator systematically canvasses an assignment area identifying all housing units and adding to the list any missing addresses. So, if the Smiths' address is not on the commercial list that the Postal Service checks, an enumerator canvass would result in adding their address to the list.

If the Smiths had lived in an area where commercial mailing lists were not available, the listing would have been accomplished by Bureau personnel following a structured path of travel, with callbacks and Postal Service checks, as necessary.

The count of all the addresses on the block where the Smiths live will also be checked for accuracy prior to the mailing of the questionnaire through an independent approach. Counts of addresses on the mailing lists at selected geographic levels down to blocks in urban areas will be given to local governments for review as part of the Bureau's local review program. In this case, Mayor Maynard Jackson's staff—using varying sources of data such as water, gas, and electric utilities—can verify the accuracy of the lists. This local review program will be taking place throughout the country. Some 32,000 of the 39,500 local units of government have responded positively, to date, on participation in this program.

On Friday, March 28, 1980, the Smiths will receive their census questionnaire and instruction kit in the mail. They will be asked to fill it out as of Tuesday, April 1, and mail it back as soon as possible. They will also be asked to indicate the number of housing units at their address as another check for missing households. If they experience difficulty in filling out the form, they can get help by calling the local telephone number indicated on the address label. If they are of Spanish origin and have difficulty with the English language, they can request a copy of the questionnaire in Spanish. As the questionnaires are mailed back to the local district census office, the Smiths will be checked off against the master address lists. If they do not mail back the questionnaire, an enumerator selected from the immediate area will be sent out to conduct an interview to collect the data and will call back, as necessary, to complete the interview. And where required, the interviewer will have the appropriate bilingual language capabilities.

In the district office the questionnaire will be subject to an editing check to ensure that all questions are answered and information on all individuals is complete. If discrepancies are noted, callbacks will be made by telephone, first, or by a visit to the home if the household cannot be reached by telephone.


1980 CENSUS MAIL/NON-MAIL AREAS
MAIL
NON-MAIL

1/8/79

Figure 9-1. 1980 CENSUS MAIL/NON-MAIL AREAS

> There are special procedures for enumerating the transient population such as families in the process of moving, families away from their usual home during the census period, persons with no fixed address, persons in hospitals, hotels, and flophouses, and there are also special checks on vacant housing units.
>
> The Smiths will be encouraged to cooperate through the most massive public information effort in the Bureau's history.
>
> The Smith children will learn about the census in school and by discussion with their parents through take-home lessons. Census messages will be placed in the Smiths' paycheck envelopes, in publications of their employers, on the grocery bags the Smiths bring home, in all advertising media, and messages will also come from the pulpit on census sabbath, and from the leaders of national and local organizations to which the Smiths belong.
>
> Finally, as part of the local review program, when preliminary counts of the population of Atlanta are compiled, these totals will be reviewed by Mayor Maynard Jackson, whose staff will compare them with independently prepared estimates for small geographic areas. Any serious discrepancies would then be investigated by the 1980 census district office in Atlanta.

The Smiths are probably unaware of the scale of census operations that Director Barabba described. For them, the 1980 census is simply a matter of completing and mailing their questionnaire. However, elsewhere in Atlanta (and in hundreds of other locations) Census Bureau personnel are completing years of advance planning by implementing the data collection phase of the decennial census.

PREPARING FOR THE CENSUS

The 1970 census marked the first attempt to enumerate a large part of the U.S. population by a mail-out/mail-back census. Approximately 60 percent of the 1970 population was enumerated by that method, but less than 60 percent of the U.S. land area was covered by the mail census. Essentially, 1970 questionnaires were mailed to the housing units in most large metropolitan areas of the Nation, while the remainder of the country was enumerated by a door-to-door canvass called "conventional" enumeration.

The 1980 census will follow similar plans, but the mail-out/mail-back procedures will be expanded to cover 90 to 95 percent of the population residing in the continental United States. The conventional techniques will still be employed but they will be limited primarily to sparsely populated land areas, to Indian reservations and historical tribal lands, and to seasonal and resort areas (fig. 9-1). The conventional census procedures will be utilized exclusively in Alaska, Hawaii, Puerto Rico, and in the outlying areas that are included as part of the U.S. censuses (Guam, American Samoa, the Virgin Islands, and northern Marianas and the Trust Territories of the Pacific Islands).

1890

1900

910

920

930

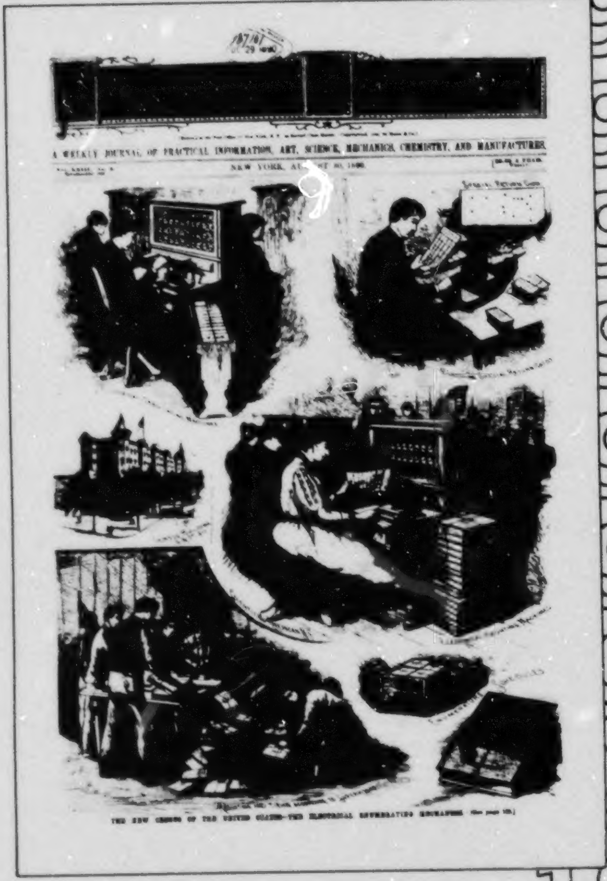
940

950

960

970

1980



A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

NEW YORK, AU[illegible]ST 30, 1890.

THE NEW CENSUS OF THE UNITED STATES—THE ELECTRICAL ENUMERATING MECHANISM.—[See page [illegible].]

and the count goes on ...

1890
1900
1910
1920
193
194
195
196
1
1

Field procedures and data tabulation both have changed considerably since 1790. Technological innovations increasingly ensure that information recorded on census questionnaires is accurately and promptly processed, thus improving the quality of the published data.

There are many steps between the questionnaire and the published census products. Errors may occur at each step. In the past, data processing by hand (e.g. coding, verifying, tabulating) required an army of people whose training, experience, and ability varied.

390
900
1910
1920
1930
1940
1950
960
970
980

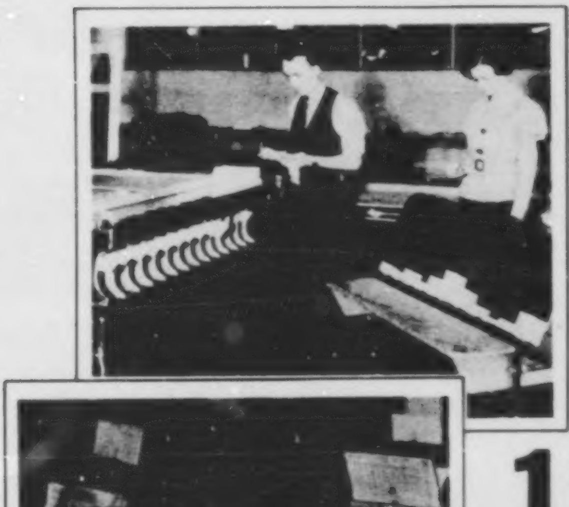
1890
1900
1910
1920
1930
1940

Herman Hollerith's card system, first used in the 1890 census, reduced the human errors in data processing. Since then, there have been numerous innovations in census technology – new and better machines to do more and more of the work: from the pantograph punch and the Electric Tabulating Machine to UNIVAC I and FOSDIC.

In addition to the machinery, the people who work at the Census Bureau have changed. Today, instead of people with little or no training or experience, the Bureau is staffed by a core of career professionals. They are responsible for the quality of the data that finally reaches the public . . . and they know it.

and

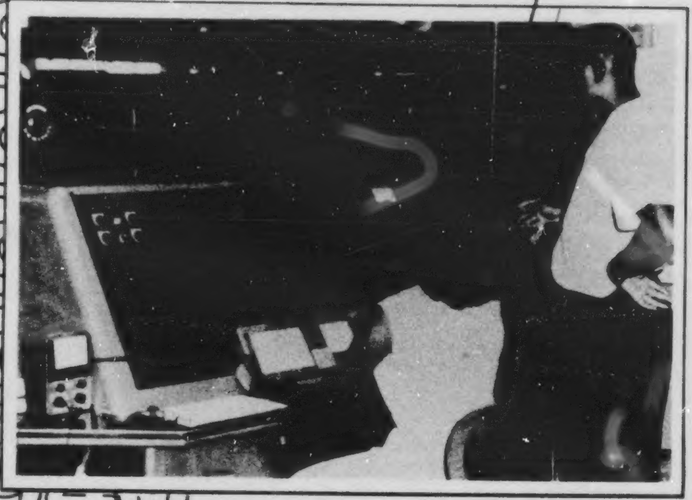
1890



900
910
920
930
1940
1950
1960
1970
1980

the count goes on ...

1890



19

19

19

19

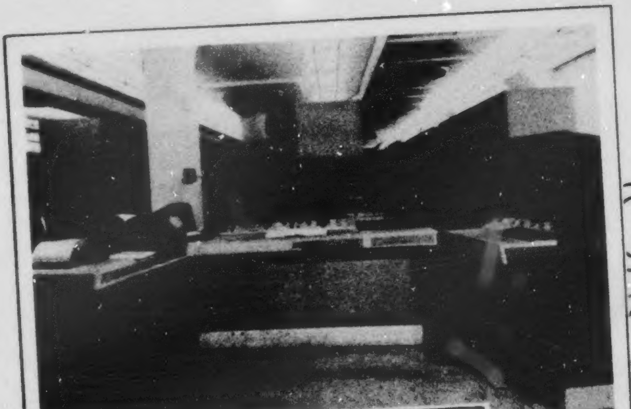
1940

1950

196

197

198



0
0
910
920
930
1940
1950
1960
1970
1980

1890

19

19

19

19

1970

and
the count goes on...

1980

Obtaining Mailing Lists

The bulk of the Nation is to be enumerated in 1980 by mail-out/mail-back procedures; thus, the discussion begins by examining how lists of living quarters (housing units) are obtained and prepared for the census.

Developing and Updating Tape Address Registers

For the large population centers of the Nation, the Bureau purchases a computer mailing list of street name and house number residential addresses from a commercial vendor. The list is acquired based upon several factors designed to identify the one that is most complete and up to date. In some instances, no single commercial mailing list is satisfactory for census purposes and more than one may be purchased and merged.

After these computerized address files are acquired, they are used to print address labels affixed to white cards that are delivered to post offices. Upon receipt of the cards, each post office sorts them by individual letter carrier route numbers and gives each carrier the cards for their route. The letter carriers examine the cards to see if there are any addresses omitted that are known to the letter carrier. If omissions are found, the letter carrier prepares a blue card showing the mailing address of the missed housing unit. In addition, letter carriers correct inaccurate addresses and pull out any cards for addresses that no longer exist or identify nonresidential places. This updating of the street name and house number address file obtained from commercial sources is known as the "advance Post Office check," and it occurred during the summer of 1979.

After the address cards were updated by the Postal Service and returned to the Census Bureau, corrections, additions, and deletions were made in the computer file and the addresses were sorted by census enumeration district and printed in ED address registers.

Prelisting

The Census Bureau has found that no computerized address list exists that is suitable for census purposes in areas other than large cities. In such areas that are included in the mail-out/mail-back census, the Bureau creates its own mailing list. This is done by hiring a large number of *listers* and assigning to each one a listing book and a map outlining a specified enumeration district to be canvassed and listed. This prelisting operation began in the summer of 1979 and continued through the fall. While canvassing, the lister recorded in an address register the mailing address of every structure where people live or could live. After the prelisting was completed, the addresses were placed on computer file for later use in the census.

Enumerators

Enumerators are employed in mail census areas to visit the households who do not mail back their census forms (and visit those who mail back incomplete forms). In conventional areas, however, each enumerator is assigned a specified land area and is responsible for canvassing, listing, and enumerating all living quarters and residents within that area. For census purposes, those small geographical areas are called enumeration districts.

Updating Mailing Lists

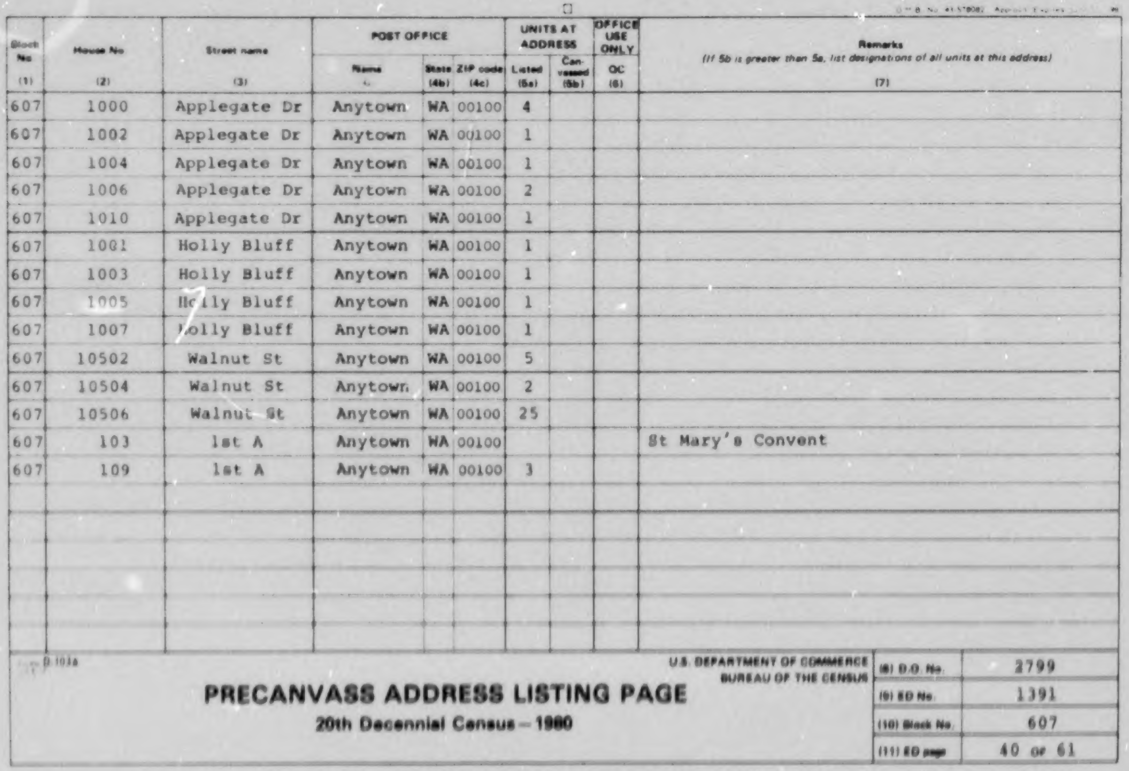
In addition to the U.S. Postal Service "advanced Post Office check," several checks are performed in order to make that file and the prelist file as complete as possible.

Precanvassing

The commercially acquired address files, which cover city delivery areas (street name and housing number addresses), are sorted by enumeration district, and the address register for each ED is printed *twice*. The first copy of the address register shows individual housing units within the ED printed one to a line (fig. 9-2). This copy will be used later to record the receipt of questionnaires mailed back to the census district office and to control the enumerator assignments. A second copy of the register is printed for a coverage improvement operation called *precanvass*. This version of the address register contains a listing of each building containing residences, but it *does not* list the individual housing units within each structure (fig. 9-3). This copy of the address register is given to an enumerator about 8 weeks before census day and the enumerator canvasses the ED, block by block, to update the register. The precanvass enumerator records in the address register the mailing address of each structure not already shown in the register and corrects the count of the number of living quarters that each structure contains if the number shown in the register is inaccurate.

Casing Check

About 1 month before census day, address labels are printed using all the computer files, and the labels are affixed to census questionnaires and delivered to post offices. Upon receipt, the questionnaires are sorted by individual carrier route and each letter carrier examines the questionnaires looking for omissions, incorrect addresses, and the addresses that no longer exist or have been converted to nonresidential use. This check, known as the questionnaire "casing check," is the first update of the prelist address list, but for the commercially acquired file it is the second update performed by the U.S. Postal Service.



☐ O.M.B. No. 41-S78087; Approval Expires

Block No (1)	House No (2)	Street name (3)	POST OFFICE Name (4a)	State (4b)	ZIP code (4c)	UNITS AT ADDRESS Listed (5a)	Canvassed (5b)	OFFICE USE ONLY OC (6)	Remarks (If 5b is greater than 5a, list designations of all units at this address) (7)
607	1000	Applegate Dr	Anytown	WA	00100	4			
607	1002	Applegate Dr	Anytown	WA	00100	1			
607	1004	Applegate Dr	Anytown	WA	00100	1			
607	1006	Applegate Dr	Anytown	WA	00100	2			
607	1010	Applegate Dr	Anytown	WA	00100	1			
607	1001	Holly Bluff	Anytown	WA	00100	1			
607	1003	Holly Bluff	Anytown	WA	00100	1			
607	1005	Holly Bluff	Anytown	WA	00100	1			
607	1007	Holly Bluff	Anytown	WA	00100	1			
607	10502	Walnut St	Anytown	WA	00100	5			
607	10504	Walnut St	Anytown	WA	00100	2			
607	10506	Walnut St	Anytown	WA	00100	25			
607	103	1st A	Anytown	WA	00100				St Mary's Convent
607	109	1st A	Anytown	WA	00100	3			

D-103a

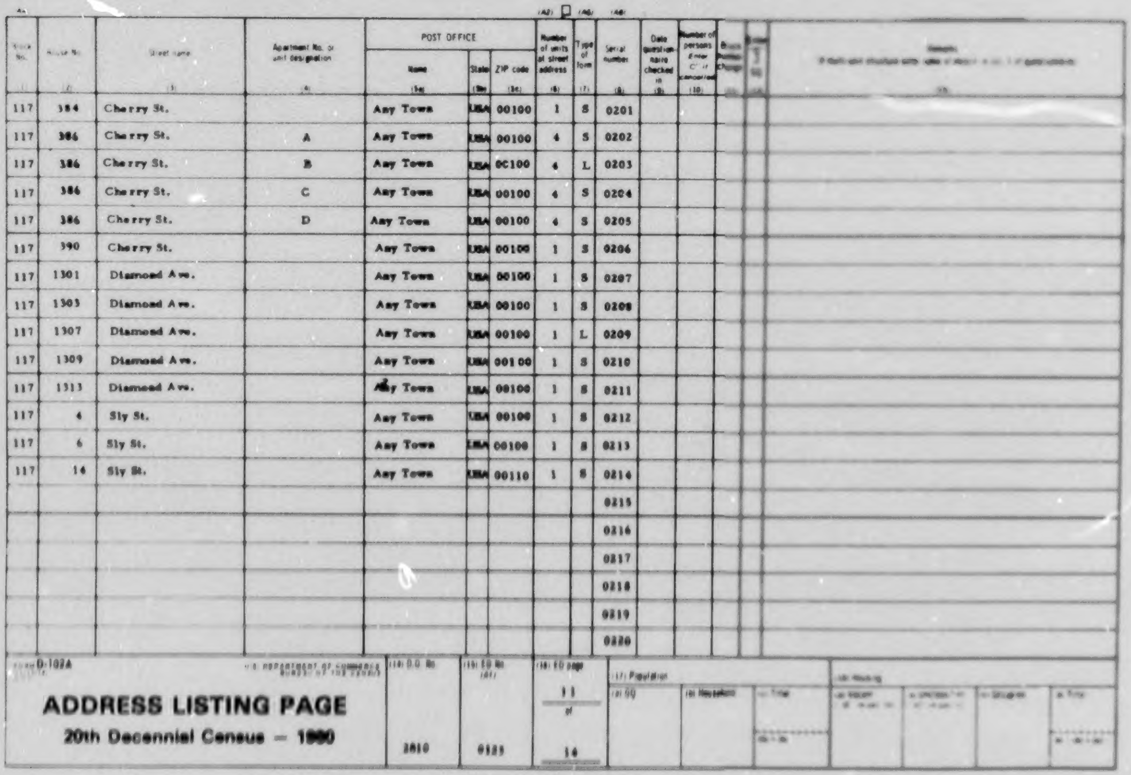
U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

PRECANVASS ADDRESS LISTING PAGE

20th Decennial Census – 1980

(8) D.O. No.	2799
(9) ED No.	1391
(10) Block No.	607
(11) ED page	40 of 61

Figure 9-2. PRECANVASS ADDRESS LISTING PAGE



Block No. (1)	House No. (2)	Street name (3)	Apartment No. or unit designation (4)	POST OFFICE Name (5a)	State (5b)	ZIP code (5c)	Number of units at street address (6)	Type of form (7)	Serial number (8)	Date questionnaire checked in (9)	Number of persons Enter "C" if canceled (10)	Block number change (11)	[illegible] (12)	Remarks (13)
117	384	Cherry St.		Any Town	USA	00100	1	S	0201					
117	386	Cherry St.	A	Any Town	USA	00100	4	S	0202					
117	386	Cherry St.	B	Any Town	USA	00100	4	L	0203					
117	386	Cherry St.	C	Any Town	USA	00100	4	S	0204					
117	386	Cherry St.	D	Any Town	USA	00100	4	S	0205					
117	390	Cherry St.		Any Town	USA	00100	1	S	0206					
117	1301	Diamond Ave.		Any Town	USA	00100	1	S	0207					
117	1303	Diamond Ave.		Any Town	USA	00100	1	S	0208					
117	1307	Diamond Ave.		Any Town	USA	00100	1	L	0209					
117	1309	Diamond Ave.		Any Town	USA	00100	1	S	0210					
117	1313	Diamond Ave.		Any Town	USA	00100	1	S	0211					
117	4	Sly St.		Any Town	USA	00100	1	S	0212					
117	6	Sly St.		Any Town	USA	00100	1	S	0213					
117	14	Sly St.		Any Town	USA	00110	1	S	0214					
									0215					
									0216					
									0217					
									0218					
									0219					
									0220					

FORM D-102A

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

ADDRESS LISTING PAGE

20th Decennial Census — 1980

(14) D.O. No.	(15) ED No. (A1)	(16) ED page	(17) Population	(18) Housing
2810	0125	11 of 14	(a) GQ (b) Household (c) Total	[illegible]

Figure 9-3. ADDRESS LISTING PAGE

Time of Delivery Check

On March 28, letter carriers deliver the census questionnaires, and as the questionnaires are placed in the mail receptacles, the letter carriers make one final check to assure that they have a census questionnaire for each housing unit on the route. Once again, any omissions discovered by the carriers are brought to the attention of the district offices so that questionnaires can be addressed and mailed promptly.

Other Preparatory Activities

Described above are the essential operations taken to compile and update the mailing lists used in mail-out/mail-back areas. In addition to those activities, several other preparatory steps are also taken.

Special Places

All of the operations described to this point are designed to ensure that each residential address will receive a questionnaire on March 28. However, to stop at this point would mean that individuals at private residences would have a better chance of receiving a questionnaire than individuals living in group situations. Thus, when developing the mailing list, an effort is made to identify the address of each place where people live in group situations. For census purposes, these dwellings (such as hotels, motels, hospitals, college dorms, penal institutions, and mental institutions) are called "special places."

Instead of mailing questionnaires to special places, each place is visited by a census enumerator prior to census day and arrangements are made with the management, caretaker, etc. to have the patients, inmates, or residents enumerated. Enumerators arrange to deliver the census forms to the individual in charge of each place, who in turn agrees to give a questionnaire to each resident or to place one in each of the individual living quarters within the place. The management also collects the sealed envelopes containing the questionnaires and holds them for the enumerator to pick up. These arrangements, involving the assistance of the management of special places, are made before "census day."

Geographic Materials

Three important geographic activities were completed in preparation for the census. First, for the purpose of controlling the actual data collection, the entire Nation was divided into approximately 300,000 census enumeration districts. For each ED a map was prepared showing its boundaries, and also the major streets, highways, rivers, and other physical features. These maps will be used both by the census enumerators who prelist and precanvass, for followup enumeration in the mail areas where census questionnaires are not mailed back, and by the enumerators who canvass, list, and enumerate in conventional census areas. In addition to the preparation of maps for field activities, the computer geographic coding system known as GBF/DIME has to be created and periodically updated for the urbanized areas of SMSA's. This system is used to automatically match the proper census geography codes (e.g., blocks, census tracts) with the addresses located on the address registers.

In creating an address register for each census enumeration district it is vital that each address on the computer file be codable to its appropriate ED. Occasionally, the computer will print an address as uncodable. The address may be uncodable for a variety of reasons: The geographic coding software does not contain the specific street for the housing unit, does not recognize the housing number range, or perhaps because the address may be for a route and box number or some other kind of noncity delivery mailing address where the GBF/DIME system cannot operate.

Addresses that cannot be geographically coded by the computer coding system must be coded in the field. This is done by printing out an address label for each uncodable address and affixing the label to a card. The cards are given to census enumerators who must physically locate the address and assign it to the appropriate census ED (by referring to census ED maps).

Recruiting and Selecting Employees

As mentioned earlier, over 400 temporary district offices were established for taking the 1980 census. Each office will employ more than 500 persons, covering jobs ranging from district office manager to supply clerk, but the majority will be field enumerators. In total, the taking of the 1980 census will require approximately 275,000 temporary workers. Thus, allowing for employee turnover, it is expected that before the 1980 census is completed more than 1 million persons will have been recruited and tested for these census jobs.

In order to staff an operation of this size, it should be clear that massive recruiting efforts are necessary. In addition to the recruiting activities carried out by each of the district offices, more than 800 other recruiting centers will be opened throughout the United States. Job opportunities are advertised both in the electronic and print media, through State employment agencies, as well as by the placement of posters, flyers, and similar literature in shopping centers, eating establishments, and other public places.

Each applicant for a census job is required to fill out an application form that determines his/her suitability for Federal employment and is also required to take a job-related test that measures the applicant's knowledge, skills, and abilities for census work.

TAKING THE CENSUS

The 409 temporary district offices are scheduled to open during January 1980. About that time, the district manager and a few key assistants, consisting of supervisors for field operations, office operations, administration, and special place activities, begin preparations for taking the Census.

Among the 409 district offices, 24 will utilize conventional census procedures and 10 will incorporate both mail and conventional procedures. The remaining offices will employ the mail-out/mail-back techniques.

District offices involved in the mail census are of two types. Eighty-seven offices, those located in the most populated cities, are referred to as "centralized," while the remaining 298 mail-area offices are called "decentralized."

Mail-Out/Mail-Back Areas

Questionnaire Mail Out

On Friday, March 28, 1980, letter carriers of the U.S. Postal Service are scheduled to deliver a census questionnaire to each living quarters with an address listed in an address register. Each questionnaire contains instructions for completing and mailing the form back to a district office. To standardize the return procedure, a franked, preaddressed envelope is provided for the household to use to return the form. It is projected that approximately 80 percent of all households will complete and promptly return their census forms by mid-April.

Questionnaire Mail Back

On April 2, clerks in the district offices are to open questionnaire envelopes that are mailed back to the office and sort the returns by enumeration district (ED) and serial number. They also are to note in the address register each returned questionnaire that was mailed back and to record the household name. Next, they are to quickly examine census questionnaire item H4 (How many living quarters, occupied and vacant, are at this address?) to see if the respondent reported more living quarters at the address than were recorded in the address register. If, for example, the address register shows four housing units for a street number but one or more of these respondents reported five or more apartments when answering item H4, the address will be visited to see if it contains missed living quarters.

Although the mail returns will be edited more closely at a later date, it is important that buildings containing potentially missed living quarters be identified rapidly. Since followup enumerators should visit such addresses to enumerate the living quarters to which questionnaires were sent but not returned, it is important that initially missed quarters also be enumerated on that visit.

Questionnaire Edit

The editing of the mail-returned questionnaires is scheduled to begin on April 15. Edit involves examination of each questionnaire to see if it can be read by the FOSDIC equipment, to see if it was only partly completed, and to see if any of the answers are inconsistent among themselves. Questionnaires received in damaged condition are copied onto new forms, and unanswered questions (e.g., the marital category of "never married" can be imputed for a person reported to be 2 years of age) and those that are inconsistent are examined to see if corrections can be made during the edit.

Clerks edit the questionnaires placing a template over each page so that only the answers are revealed. Each item is examined to see that one and only one answer category was marked by the respondent. Instructions printed on the template tell the clerk the conditions under which a question may be skipped and when an answered questionnaire item is to be checked for consistency with one or more other items. Although the *concept* of questionnaire editing appears to be simple, it is one of the most complex and important operations carried out by the district office staff. In fact, next to the actual enumeration, editing is the single most important census operation that has a direct effect on the quality of census data, and the use of templates helps measurably to improve the data quality as well as to make an extremely detailed and difficult job become manageable. Further assistance is provided by training editors to work only on short or long forms.

In *centralized offices*, all questionnaires containing one or more edit rejects are given to clerks in the office where telephone followup is attempted to repair the forms. After the telephone attempt to repair all deficient questionnaires in centralized offices, only those still containing a large number of errors are scheduled for personal visit followup. In *decentralized offices* budget and space limitations prevent staffing the offices with telephone followup clerks. Instead, all short forms containing 4 or more errors and all long forms containing 10 or more are marked for personal visit followup. Forms containing fewer than four and ten errors, respectively, are acceptable.

Followup Number 1 (Nonresponse Followup)

In mail-out/mail-back areas there are several reasons why enumerators are required to visit households. The first followup begins on April 16 (almost simultaneously with the questionnaire edit) and consists of visits to the living quarters from which questionnaires were not returned. It is expected for 1980 that approximately one-half of the nonresponse addresses will be found to be vacant housing. The remainder will likely be occupied by persons who, for various reasons, simply failed to mail back their questionnaires. Each Followup 1 enumerator is assigned one or more ED's and is given a supply of blank short and long forms along with a copy of the address register that shows those addresses that did not respond by mail. These enumerators must visit each nonresponse address and must interview an adult member of the household, if the living quarters is occupied. For vacant living quarters, the enumerator must obtain answers to the housing questions from the owner or manager of the property or from a knowledgeable neighbor. It is important that the enumerators finish the nonresponse followup within 6 weeks, since a second type of followup is scheduled to commence by the end of May.

As the Followup 1 questionnaires are sent to the centralized offices (but not the decentralized offices) they too are clerically edited. For decentralized offices, the limited amount of office space and budget restrictions prevents the editing of enumerator-filled questionnaires.

Telephone Followup

After the edit of the questionnaires mailed back to centralized offices, the first followup should be attempted by telephone calls from the office. This telephoning is to begin on April 24 and lasts about 1 month. Questionnaires that cannot be repaired (e.g., no response after four attempts made at different times of the day) as well as those missing a telephone number will be given to enumerators to visit as part of a second followup.

Followup Number 2 (Edit Failures and Coverage Improvement)

By the end of May, virtually all questionnaires that are mailed back will be edited and most of the nonresponse addresses will be personally visited and enumerated. Also, in centralized offices, the telephone followup to complete the edit rejects will be finished. Thus, on May 30, enumerators are to begin what is formally called Followup 2. Essentially, this operation is intended to improve both the coverage of the population and the quality of the data collected. Each Followup 2 enumerator will be assigned one or more ED's and will be given a work assignment covering a variety of situations.

First, all mail return questionnaires that were returned partially completed and that could not be repaired by the telephone followup will be given to enumerators for repair.

Second, any remaining nonresponse addresses are included in the Followup 2 enumerator's assignment.

Third, all nonresponse address that the Followup 1 enumerator reported as vacant and any that are deleted from the address register as *nonexistent* are reassigned to be revisited during Followup 2. Experience in earlier censuses has shown that many such living quarters are misclassified and that a considerable number of persons have been missed in the census without this second check. (In the 1970 census, for example, it was estimated that slightly more than 1 million persons would have been missed without a followup on vacant and deleted housing reports.) Before reassigning the occupied and vacant listings for recheck, each enumerator's original reports are to be exchanged so that no Followup 2 enumerator double checks his or her own work.

Fourth, each district office will receive from local Motor Vehicle Administration offices the names and addresses of registered drivers. These lists will be prepared for urban areas with large concentrations of minorities and will be restricted to persons 16 years of age and over. A search will be made among the census records within the district office to determine if the drivers have been enumerated in the census. The names and addresses of persons not found in the census will be included as part of the Followup 2 enumerator's assignment. The enumerators will try to determine if the drivers have (1) moved from the area, (2) been enumerated at some other address in the area, or (3) been missed. In the latter event, Followup 2 enumerators will add them to the census.

Special Place and Casual Count Enumeration

Interspersed throughout the above census operations is the enumeration of special places. T-Night and M-Night enumeration, in general, is targeted on living quarters that are classified in the census as special places. These special places include military bases, crews of vessels, hospitals, prisons, colleges and universities, national and state parks and resorts, trailer courts and mobile home parks.

T-Night and M-Night Enumeration

Individuals living in group quarters are not scheduled to receive a questionnaire through the mail. Instead, most residents are to be personally visited by a select group of enumerators called, appropriately, "special place enumerators." Although special place enumeration is planned to continue throughout April and May, two categories of places are targeted for enumeration during specific evenings. Within each district office's territory, hotels, motels, and other places that provide housing at a cost of $4 or more per night are designated as T-Night (transient) places and are to be enumerated on the evening of Monday, March 31. Enumerators who visit such places are to hang a packet on the door of each room identified by the management as either vacant or occupied by transients.* Each packet contains two abbreviated short forms called "Individual Census Reports" (ICR's). Persons occupying rooms in T-Night places are asked to fill out the ICR's and mail them to the nearest census office in the preaddressed, franked envelopes included in the packet. If a transient reports their usual place of residence to be outside the district office's territory, the ICR should be forwarded to the proper district office so that the transients are counted where they normally live.

On April 8 (M Night), special place enumerators are also to visit missions, flophouses, local jails (where people stay for 30 days or less), and other inexpensive lodging places.

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* Nontransient living quarters within T-Night places, usually the residences of the owner or manager and of permanent guests, are included in the questionnaire mail out.

One further enumeration activity is worthy of separate mention. This is an operation called the casual count, which occurs only in centralized offices. Casual count will begin on May 6 and conclude around the 20th of the month. During the casual count, special place enumerators visit sites where transient individuals are known to congregate such as unemployment offices, pool halls, welfare offices, and food stamp centers. Particular emphasis is placed upon visiting those places that are generally frequented by minorities in the 18 to 35 years of age category. Clearly the purpose of the casual count is to try to include in the census individuals who may not have any permanent place of residence and who, in the past, have been found to have high census-miss rates.

Quality Control

Many of the office and field operations described in this section are subject to quality control checks. Most of these quality control checks involve replicating a probability sample of the work and comparing the sample results with what was done in the census. The quality control of the precanvass can serve as a useful illustration. Recall that the precanvass enumerator is given an address register which shows the basic street names and house numbers of residential buildings but does not provide a line by line listing of the individual living quarters. Instead, the listing for each street address shows the count of apartments thought to exist within the structure. Prior to printing the precanvassers copy of the register, a sample of the living quarters counts is suppressed. In other words, if a structure were on the address file as containing 10 apartments, 1 may be suppressed so that the precanvass register shows 9 as the number of living quarters.

Before the precanvassing begins, a list of the suppressed living quarters is taken into the field where the existence of the dwellings is actually verified. This verified list is held in the district office until the ED has been precanvassed and the enumerator has returned the address register. At that time, the verified list of suppressions is compared with the precanvassers work to determine whether or not the intentional incorrect apartment counts were corrected by the precanvasser.

Conventional Area

Prior to the 1970 census, the traditional method of taking the decennial census was to assign an enumeration district to each enumerator. The enumerator was provided with a map outlining the boundaries of the ED, a supply of blank questionnaires, and a blank listing book or address register. The enumerator was responsible for canvassing, listing, and enumerating every place within the ED where people lived or could live.

Essentially the same procedure will be used in 1980 to enumerate about 10 percent of the population. (The conventional census procedures, although limited to some 10 percent of the population, will, nevertheless, cover almost one-half of the U.S. land area.) The conventional census district offices are scheduled to open late January or during the first week of February. Twenty-four offices will strictly follow conventional census-taking procedures, while an additional 10 will apply a combination of conventional and decentralized enumeration procedures. As with the mail areas, the offices will be fundamentally involved in preparatory activities during the first quarter of the year. They will be furnished, stocked with supplies, and staffed. In addition, advance arrangements will be made to enumerate the special places within each office's territory.

On March 28, letter carriers of the U.S. Postal Service will deliver a blank short-form questionnaire to each patron on the route and also will give a copy to each lock box and general delivery patron. Each household is asked to complete the short form and to hold it for the census enumerator to pick up. On April 1, the conventional enumerator will begin canvassing, listing, and picking up the short forms. As in the mail areas, about one household in five is to be enumerated on a long form. Thus, as the enumerator lists living quarters in the address register for the long-form recipients, (s)he will copy the short-form information onto a long form then ask the remaining long-form questions.

When enumerating Indian reservations and the historical tribal lands, enumerators will identify each household containing one or more Native Americans. For each such residence a supplemental questionnaire will be completed by the enumerator to collect additional data that will be used by the Bureau of Indian Affairs, the Department of Housing and Urban Development, and other agencies. This supplemental information will be used to plan programs with American Indians.

Office Quality Control

The conventional district offices have less space than mail area offices, and they do not employ large clerical staffs to edit questionnaires and to perform telephone followups for the edit failures. Instead, a sample of each enumerator's work is selected and edited. Based upon the sample results, the questionnaires for the ED are either accepted or rejected and reedited in total with a field followup to repair unacceptable work.

Postenumeration Post Office Check

Lists of mailing addresses for conventional census areas are created during the census; thus, they are not available for review and update by the Postal Service prior to April 1.

As the address registers for conventional ED's are created, enumerators prepare an address card for each occupied and vacant living quarters enumerated in the census. On May 9, letter carriers of the U.S. Postal

Service examine those address cards, route by route, and notify the district office of any postal patron for whom the carriers did not receive a census card. Enumerators visit and enumerate those addresses in order to include the households in the census.

Followup

One followup operation is undertaken for conventional areas. As with the mail areas, all living quarters initially reported to be vacant or listed then deleted from the address registers are to be rechecked. Also, followup enumerators will be assigned to repair the census questionnaires that failed the office edit. This followup enumeration begins on May 23 and is scheduled for conclusion by June 6.

CLOSING FIELD OPERATIONS

When all addresses and questionnaires for an enumeration district are accounted for, a population and housing count is made. The data are summarized block by block and ED by ED. As the information for each ED is

Trust Territory Census

The Trust Territory of the Pacific Islands undertakes the 1980 census in fall 1980.

The challenge facing the Bureau in the Trust Territory is both big and small. The area within the informal boundaries of the Trust Territory contains 3 million square miles—almost equal to the land mass area of the United States. But the 2,100 islands of the Trust Territory contain only 717 square miles of land—half the size of Rhode Island. The actual enumeration area is even smaller since most of the islands are uninhabited and only 100 of them will be included in the census.

On Saipan, the major island of the Mariana District, is the central office of the 1980 census. From Saipan, which is also the seat of government for the Trust Territory, census forms printed in English will be distributed to central locations in all island groups. English is used on the census questionnaires since it is the second language of the Trust Territory. The first language in each area is a local dialect. To enumerate the estimated 21,000 households, the Bureau will use and train local teachers. At central locations in the island groups, teachers will pick up questionnaires along with school supplies for the academic year beginning in September. After arriving at their island posts, the teachers will also act as door-to-door enumerators. Data collection is scheduled to end in November, when all the questionnaires are expected to be returned to the collection point in Saipan. At Saipan, the Bureau will station an advisor to supervise the count, and to make on the spot corrections before forwarding the questionnaires to the States.

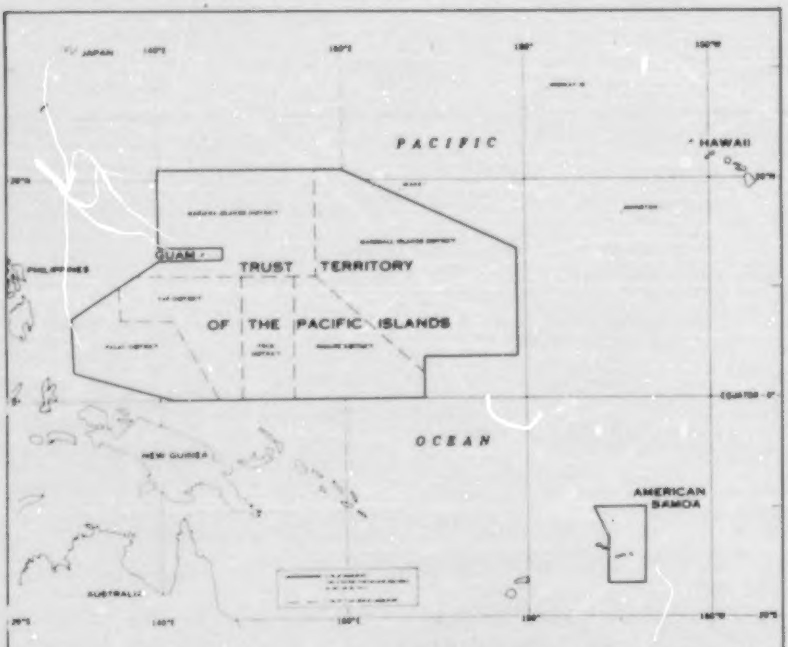
The 1980 census may be the last of this type of census for the Trust Territory. Governing bodies of the various islands are in the process of deciding whether they wish to remain a trusteeship of the United States. A decision is expected by 1981, a year after the decennial count.

summarized, the 1980 population and housing counts are compared with the 1970 figures. If gross discrepancies between the 1970 and 1980 counts are identified a recheck may be undertaken by the district office. This may involve merely readding the figures, or it could require enumerators to return to the ED to check out possible omissions.

When all population and housing counts for each ED have been compared with the 1970 data and possible discrepancies have been investigated a listing of the population and housing counts is produced at the block level. This listing is given to local elected officials for their review. The local review is a new activity for the 1980 census and is actually performed twice: Prior to the census and at the conclusion of the field enumeration.

Precensus Local Review

A precensus local review is to take place in early 1980 before census day. A count of the addresses compiled from the census mailing lists is prepared for areas included in the mail-out/mail-back census. (No precensus local review



INHABITANTS of the Trust Territory are called Micronesians, a term derived from the small size of the islands. Some are tiny atolls less than a square mile in area. About 100 of the islands will be included in the 1980 census.

The area was controlled by the Japanese under a mandate from the League of Nations before World War II, and since that time has been administered by the United States under a trusteeship agreement with the United Nations.

can be undertaken in conventional census areas because no precensus address list exists.)

The Census Bureau uses the mailing address lists to determine the initial counts of housing units. These counts are prepared for each functioning governmental unit, such as county, minor civil division (for example, townships), and incorporated municipalities. In addition to the 1980 precensus counts of addresses, the 1970 housing counts are also provided. Along with the listing, each governmental unit receives a set of census maps to aid them in reviewing the counts. The review itself is conducted for the lowest level of geography for which housing counts are available. During the review, an effort is made to identify major discrepancies between the 1980 counts and local estimates. If large discrepancies are found, the Bureau is notified in writing of the specific areas in question and also given supporting documentation of the discrepancies. Generally, local officials use information such as building permits, utility connections, and tax records to identify areas of possible housing unit omission.

Postcensus Local Review

For the postcensus local review, the data and maps reflect the Jan. 1, 1980, completed in all areas, including conventional census areas. Preliminary population and housing counts derived from the field operations are summarized and given to the local officials in the same manner as the precensus data were provided. Of course, the postcensus figures also include the preliminary population counts for 1980.

For the postcensus local review, the data and maps reflect the Jan. 1, 1980 legal boundaries of governmental units (see chapter 4). The postcensus local review is intended to identify the geographic areas in which there is supporting evidence of a questionable 1980 population and/or housing count. The more closely a potential problem can be pinpointed by local officials, the more effectively the Bureau will be able to investigate the problem. As with the precensus review, the Bureau must be notified in writing of any suspected undercounts and must be given supportive evidence to document the questioning of the data. Such evidence could include the results of an independent canvass, notification by residents of specific areas that they had not been enumerated, or discrepancies between the census figures and administrative records such as building permits. Approximately 10 working days after the preliminary population and housing counts have been delivered to local officials, the Census Bureau will undertake an investigation of any questionable results. The time period is extremely tight in this schedule but it is felt necessary to allow time for a full investigation of questionable figures, since the investigation might require additional field work.

Closing the District Offices

With the conclusion of the local review program, the actual data collection of the 1980 census ends. The target date for closing the centralized district offices is August 8, the decentralized offices, July 25, and the conventional offices, July 11.

The address registers, census questionnaires, and other related census materials are boxed and shipped for processing. The material for all centralized and conventional census offices are shipped to the Census processing facility in Jeffersonville, Ind. The material from the decentralized district offices is shipped to one of three processing offices—Jeffersonville, Ind., New Orleans, La. or Laguna Niguel, Calif.—depending upon the office's proximity to the site.

The shipping of all materials to a processing center essentially concludes the actual data collection operations. It should be pointed out, however, that some field activities will continue throughout 1980 and possibly through 1981 as well. This latter field work involves reinterviews, record checking, and similar activities required to complete the 1980 census evaluation and research program.

Reference

1. Statement by Vincent P. Barabba, Director, Bureau of the Census before the Committe Post Office and Civil Service, House of Representatives, September 18, 1979.

Chapter 10

PRODUCTS AND SERVICES

INTRODUCTION

The big payoff for the years of planning, the millions of dollars spent, and the public cooperation that go into conducting the census are the facts that result from that effort: Facts for representative government, facts for social planning, facts for sharing the fiscal pie, and facts to meet the multiplicity of needs of an ever growing community of data users. In recent decades the Bureau of the Census has taken steps to ensure that the payoff—the delivery of data—is truly commensurate with the scale of the factfinding effort. It is delivering more data than ever before, both in terms of more cross-tabulations and greater geographic detail. And it is issuing the data through a variety of media (e.g., computer tapes, microfiche, and printed reports) giving users additional data not available to them before and greater flexibility in using it. The last 20 years have seen the Bureau become a service agency, a data deliverer, as well as a factfinder.

The growth in the number of pages in Census Bureau population and housing publications illustrates the modern emphasis on making more facts available. A slender volume of 56 pages summed up the results of the first census, and through 1870 the number of pages for all publications (e.g., population, agriculture, and manufacturing) never exceeded 3,500 for any one census year. For the 1910 census, 4,300 pages were devoted to population publications. In recent censuses, the magnitude of printed pages has grown considerably. By 1950, population and housing volumes contained about 50,000 printed pages, and in each of the next two censuses, the number of pages doubled—to about 100,000 in 1960 and 200,000 in 1970. Not only has the sheer number of pages increased, but as a result of the development of electronic photocomposition techniques, 1970 pages contained 20 percent more data than their 1960 counterparts. (A summary of recent products and the availability of data user services is provided in the Appendix.) For the 1980 census, the Bureau will publish some 300,000 pages. The population and housing volumes will be enlarged because of an increase in the number of SMSA's, blocks, tracts, other geographical areas, and the need for more statistics for racial and ethnic groups.

As it has done since 1960, the Bureau will provide data on computer tapes and on microform, in addition to printed reports. The Bureau will tabulate much more data than it publishes and all of the tabulated figures—published and unpublished—will appear on summary tapes. The printed reports and some additional summary data from tapes appear on microfiche for the convenience of users who need to save space or to have access to data that is not available in printed reports.

Not only is the Bureau delivering more information through a greater variety of media, but it is also facilitating its access and use by: (1) Publishing reference material describing how to use the facts, where to find them, and how they were collected; (2) conducting seminars, workshops, and training sessions to educate data users in product availability and use; (3) allocating staff to answer user inquiries and provide consultation on data products and services; and (4) fostering the development of user assistance services in organizations outside of the Census Bureau. Each of these communication activities is discussed below.

PRINTED REPORT SERIES

As in the 1970 census, the printed publications program for 1980 is organized into three groups: those containing primarily population census data (PC reports), those containing primarily housing census data (HC reports), and those containing both population and housing data (PHC reports).

For the most part, the 1980 reports will parallel the 1970 reports. However, there will be more data tabulated by race, Spanish/Hispanic origin, and ancestry. The geographic areas presented in the printed reports will also be comparable to those shown in the 1970 census with some elaboration. For example, the 1980 reports will provide more data for Alaskan Native villages than were provided in 1970, and more data will be shown for American Indians. Also the block statistics program has been expanded for 1980. Data will be presented for blocks not only in urbanized areas, as was done in the 1970 reports, but for places of 10,000 or more inhabitants outside of urbanized areas and for a number of communities with populations of less than 10,000 that have contracted for the publication of block statistics.

A Primer on 1980 Printed Reports

Data presented in 1980 census reports will be similar in kind and quantity to the data contained in reports resulting from the 1970 census.

First to appear will be *Preliminary Reports*, one per State, presenting *unofficial* population and housing counts for States, counties, county subdivisions, incorporated places, SMSA's, and congressional districts. These will be issued in late 1980. Starting in the winter of 1980-1981, *Advance Reports* will present final counts which will supersede the unofficial counts in the preliminary reports.

Final Reports appearing in 1981 generally will contain only data based on the complete count part of the census. Beginning in late 1981 the focus will shift to the publication of estimates based on sample data (e.g. income, occupation), for many users the most useful and interesting data in the census. The reports with the greatest amount of subject detail will begin to be published in mid-1982.

Final reports generally will be issued for individual States or SMSA's. They will contain limited subject matter detail for those report series that present data at the small area level—blocks and census tracts. Reports including greater amounts of subject matter detail will include less geographic detail.

Most of the 1980 report series will be produced on a State by State basis, with reports for the smaller States appearing first, while reports for larger States with large cities are likely to take longer to produce. National summary reports in a particular series become available generally only after the last State report has been produced. In all, there can be 6 to 9 months difference between the appearance of the report for the first State and the publication of the national report in the same series.

Due to the time requirements of printing reports it will in certain cases be possible to obtain data on computer tape from 1 to 3 months in advance of the availability of a corresponding publication.

Population And Housing Reports

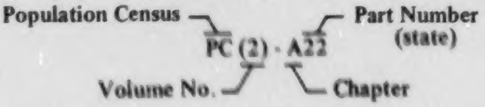
Preliminary Reports

Preliminary Population and Housing Unit Counts (PHC(P)). As indicated earlier, preliminary, unofficial population and housing unit counts will be compiled in the census field offices. One report will be issued for each State, the District of Columbia, Puerto Rico, and other outlying areas. Each report will show preliminary population and housing unit counts for the State, counties, county subdivisions, incorporated places, SMSA's (as designated prior to the census), and congressional districts. The series will include a U.S. summary report.

Advance Reports

Final Population and Housing Unit Counts (PHC(V)). Advance reports are designed to quickly provide the same data items as are available in the preliminary reports; however, the data in this series are final, official population and housing counts for the State, counties, county subdivisions, incorporated places, census-designated places, SMSA's, and congressional

A Primer on the Report Numbering System



The Census Bureau makes heavy use of the series designation of reports rather than continually repeating the full titles. The structure of the report numbering is shown above. The PC(2) indicates the volume II series for the population census, A is a subdivision or chapter within that series, and 22 indicates the specific unit of issue, in this case for the State of Maryland. HC(1) then refers to the volume I series for the Housing Census. In the PC(1), HC(1), and HC(2) series the first report in each series is a U.S. summary (e.g., PC(1)-A1).

districts. This series will have a report for each State, the District of Columbia, Puerto Rico, and other outlying areas. It will also include a U.S. summary report.

Final Reports

Block Statistics (PHC(1)). One report will be published for each SMSA to present population and housing counts, as well as a limited number of characteristics based on 100-percent data. No estimates based on sample data are provided at the block level because they would be too unreliable. The series will also include a report for each State to present block statistics for cities of 10,000 or more outside SMSA's and for the communities outside SMSA's that have contracted with the Census Bureau to obtain block statistics from the 1980 census. This series was designated HC(3) in the 1970 census.

Census Tracts (PHC(2)). A census tract report will be published for each SMSA and a separate report will be published by State to provide data for the tracted areas outside of the State's SMSA's. Data on most subjects, including both complete-count and sample estimates, will be presented for each tract. If there are 400 or more blacks, American Indians, Asians and Pacific Islanders, or persons of Spanish origin in the tract, then separate tables will be published for the qualifying groups. The 1980 Census Tract reports will also include land area and population density figures for each census tract. This series was designated PHC(1) in the 1970 census.

Summary Characteristics for Governmental Units (PHC(3)). This new report series (one for each State) will be published in response to the need for data for a single source of summary characteristics for governmental units in each State. About 80 summary characteristics, derived from both complete-count and sample-estimate data will be presented for all governmental units (e.g., counties, incorporated places). This will be the only published source for complete-count characteristics for places with fewer than 1,000 inhabitants and for sample-estimate characteristics for the active minor civil divisions and places with fewer than 2,500 inhabitants.

Population Reports

Final Reports

Characteristics of the Population (PC(1)). This volume will contain separate reports for the United States, each of the 50 States, the District of Columbia, Puerto Rico, Guam, Virgin Islands, American Samoa, and the Trust Territory of the Pacific Islands. For each of these 57 areas, the data will first be issued in four separate paper-bound chapters designated as A, B, C, and D (see below: PC(1)-A, -B, -C, and -D). The four chapters will then be assembled and issued in hard-cover editions, parts 1-57. The 57 chapter A's will be assembled and issued (in mid-1981) in hard cover as Volume I, Part A.

Number of Inhabitants (PC(1)-A). Chapter A will contain the final official population counts for States, counties, standard consolidated statistical areas (SCSA's), SMSA's, urbanized areas, county subdivisions, incorporated places (including towns/townships in selected States), and census designated places.

General Population Characteristics (PC(1)-B). Chapter B will contain complete-count data for population characteristics and cross-tabulations by

A Primer on the 1980 Census Final Reports

Volume I reports. The most widely used reports constitute volumes 1 in both the population (PC (1)) and the housing (HC (1)) series. These reports present the basic data for States, SMSA's, urbanized areas, cities, and counties, and, to a more limited extent, Indian reservations.

Small Area Reports. Three series of reports contain both population and housing data for small areas. *Block Statistics* (PHC(1)) and Census Tracts (PHC(2)) reports had counterparts in previous censuses. *Summary Characteristics for Governmental Units* (PHC(3)) is a new series with data for counties, cities, towns, and selected townships.

Subject Reports. These reports present very detailed data on selected subjects, most generally at the National level. There are separate series for population (PC(2)) and housing (HC(3)). Each report covers a separate subject.

Other Data Series. Other series include *Metropolitan Housing Characteristics* (HC(2)), *Components of Inventory Change* (HC(4)), and *Residential Finance* (HC(5)). The Supplementary Reports in the PC(5) and HC(5) series cover miscellaneous topics.

In addition to these data series, a procedural series (PHC(R)) and an evaluation series (PHC(E)) will provide methodological information about the census.

Geography Basics

Generally speaking, the larger the area the greater the number and detail of data tables published.

Especially for small areas, more data are available on tape than appear in print.

The smaller the geographic area, the more likely it is that data will have been suppressed to prevent disclosing personal information about individuals.

Data for small areas are more subject to certain kinds of error than are data for large areas.

Boundary changes from one census to another should be accounted for whenever historical comparisons are made.

race and Spanish origin where such populations are present to a significant extent. The data will be summarized for the same geographic areas as in chapter A except for the omission of places with fewer than 1,000 inhabitants and the addition of data for Indian reservations. In 1970, this report did not provide such extensive racial data and the Spanish-origin data were not available.

General Social and Economic Characteristics (PC(1)-C). Chapter C will be the first report in the PC(1) series to contain sample data. All characteristics for most areas will be repeated for each major race group and for persons of Spanish origin in every area with 1,000 or more persons in that group. This chapter will present data for the States, counties, places with 2,500 or more inhabitants, SCSA's, SMSA's, urbanized areas, Indian reservations, and Alaskan Native villages. In addition, more extensive detail on the race, Spanish origin, and ancestry categories will be presented in this report at the State level.

Detailed Population Characteristics (PC(1)-D). The last chapter of each PC(1) report will contain complete-count and sample data for States, SMSA's with 250,000 or more inhabitants, and for the central cities of these large SMSA's. Examples of the detailed subject matter include cross-classifications of age by income and characteristics of persons with limited ability to speak English.

Subject Reports (PC(2)). Unlike the PC(1) reports that are issued by State with a U.S. summary, each report in this volume will concentrate on a particular subject by presenting detailed sample information and cross-relationships on a national and/or regional level. In a few reports, data will be shown for States, large cities, SCSA's, SMSA's, and American Indian reservations. Among the characteristics to be covered are national origin, race, Spanish/Hispanic origin, type of residence, fertility, families, marital status, migration, education, employment, occupation, industry, income, and poverty status.

Housing Reports

Final Reports

Characteristics of Housing Units (HC(1)). This volume will consist of separate reports for the United States, and for each State, the District of Columbia, Puerto Rico, Guam, Virgin Islands, American Samoa, and the Trust Territory of the Pacific Islands. For each of these 57 areas, the data will first be issued in two separate paperbound chapters, designated as A and B HC(1)-A and HC(1)-B). The two chapters will then be assembled and issued in hardcover editions, parts 1−57.

General Housing Characteristics (HC(1)-A). Chapter A will contain complete counts of housing characteristics derived from the short-form questionnaire. The geographic areas parallel those found in PC(1)-B. Cross-classification by race and Spanish origin will also be similar to those found in the PC(1)-B report.

Detailed Housing Characteristics (HC(1)-B). Chapter 8 will focus on the housing subjects collected on a sample basis. Thus, items such as units in structure, heating equipment, and selected monthly costs for home ownership will be presented for States, counties, places with 2,500 or more inhabitants, SCSA's, SMSA's, urbanized areas, Indian reservations, and Alaskan Native villages. Cross-classification of data for race and Spanish-origin groups will also parallel those in PC(1)-C reports.

Metropolitan Housing Characteristics (HC(2)). Housing Volume II will cover most of the 1980 census housing subjects in considerable detail and cross-classification. There will be one report for each State and SMSA. The SMSA reports will include summary tabulations for the entire SMSA, for its central city (or cities), and for any other place in the SMSA with 50,000 or more inhabitants.

Subject Reports (HC(3)). As with the population subject reports, this volume will concentrate on particular subjects by providing detailed information and cross-classification at a national and/or regional level. Among the subjects under consideration are housing characteristics by household composition, housing of senior citizens, space utilization and structural characteristics of the housing inventory, mover households, mobile homes, and housing of selected racial groups.

Components of Inventory Change (HC(4)). This national report will be based on a sample survey to be conducted in the fall of 1980. Information regarding housing units that were either added to the housing inventory since 1973 by construction or conversion of a building from nonresidential use or deleted from the housing inventory due to demolition or conversion to nonresidential use since 1970 or 1973 will be included in this report.

Residential Finance (HC(5)). This volume will present data at the national level based on a sample survey to be conducted in 1980. Mortgage status, amount of debt, and type of ownership will be examined for both owner-occupied and renter-occupied properties.

COMPUTER TAPES

While printed reports are the most convenient form of access for most users of census data, other users who must manipulate large amounts of data prefer to obtain data in computerized form. Therefore, the Census Bureau makes substantial quantities of data available on computer tape.

Summary tapes from the 1980 census will present the same kinds of data cells as will appear in printed reports—however there will be more of them. It is expensive for the Bureau to publish data in printed form, so summary tapes provide a chance to make perhaps 10 times as much data available without the expense of printing. These additional data cells fall into two categories: More data for areas such as cities and census county divisions for which less detailed data are available in print; and data for certain types of

A Primer on Summary Tape Files for 1980

For those needing 1980 census statistics in greater subject-matter or geographic detail than will be available in the printed reports or on microfiche—or for those users who will need to manipulate, aggregate, or otherwise extensively process census data—the Bureau will provide census data on computer tape.

In addition to special-purpose files for redistricting and other purposes, census data will ordinarily become available on data in two forms—summary tape files and microdata files.

Summary Tape Files (STF's) will present extensive cross-tabulations of data summarized for a hierarchical series of geographic areas. STF's will contain essentially the same information as contained in the reports and on the microfiche—there just will be more of it. There will be more detailed cross-tabulations of data and certain data will be at a more detailed geographic level. STF's will also contain subtotals, medians, and means. There will be five series of STF's. Two of the series will be based on complete-count or 100-percent data, one of which will have data down to the block level with limited subject-matter detail. The other three series will be based on sample data and will similarly have either greater geographic detail with lesser subject-matter detail or vice versa.

Public Use Microdata Sample (PUMS) tape files will contain a small sample of unidentified individual and household records. Each household sample record will contain essentially all the census data collected about each person in a household plus the housing unit's characteristics. Names, addresses, and other information that might tend to identify an individual will not be contained on the file. Only States and groups of counties will be identified. Because these files will contain unaggregated data, users will be able to tabulate or summarize the data in any way desired.

geographic areas; e.g., enumeration districts and block groups for which there will be printed data.

The major portion of the census results will be provided in a set of five summary tape files (STF's). These STF's will yield the statistics to be presented in the above-mentioned printed reports. As with the 1970 census summary tape files (or "counts" as they were known), the 1980 STF's will be available (subject to the suppression of certain detail where necessary to protect confidentiality) on magnetic computer tape at the cost of preparing the copy.

All STF's will be arranged so that individual State tapes can be readily purchased. In addition to the STF's described below, other 1980 census computer tape files, such as the Master Area Reference File, are also described.

As with the printed reports there is an important distinction between those STF's which present complete counts (STF's 1 and 2) and those which present estimates based on the sample (STF's 3, 4, and 5). The sample estimate STF's present a much broader range of census subject matter, but when the numbers estimated are very small the estimates are subject to relatively large sampling error (see chapter 6). However, unlike printed reports, summary tapes contain no verbal descriptions alongside the numbers in the files. In order to interpret the data on the tapes it is necessary to use the technical documentation that accompanies each file. That documentation defines the data items presented and in their location on the computer tapes. Documentation is available in both printed form and machine-readable form for input into a software system for data retrieval.

Contrasts Between the 1970 and 1980 Summary Tape Files

- STF 1 basically represents a consolidation of the 1970 Census First Count and Third Count Summary Tapes; the minimum geographic levels on the 1970 First Count and Third Count were enumeration districts/block groups (ED's/BG's) and blocks, respectively;
- STF 2 corresponds to the 1970 Census Second Count, although for 1980 increased emphasis is being given to summaries presented by race and Spanish/Hispanic origin;
- STF 3 corresponds to the 1970 Census Fifth Count which provided tabulations by (ED's/BG's) and Zip Code areas;
- STF 4 corresponds to the 1970 Census Fourth Count; and
- STF 5 will be similar to the 1970 Census Sixth Count.

Summary Tape Files

Summary Tape File 1. STF 1 will provide 100-percent population and housing counts and limited characteristics data. Geographic areas that will be shown in summary records include: Blocks in blocked areas, block groups in blocked areas or enumeration districts, census tracts, American Indian reservations, Alaskan Native villages, congressional districts, places, county subdivisions, counties, SMSA's, SCSA's, urbanized areas, and States.

Summary Tape File 2. STF 2 will provide 100-percent population and housing characteristics data. Geographic areas that will be shown in summary records include: Census tracts, American Indian reservations, Alaskan Native villages, places of 1,000 or more inhabitants, county subdivisions, counties, SMSA's, SCSA's, urbanized areas, and States.

Summary Tape File 3. STF 3 will provide population and housing characteristics from the sample data for geographic areas shown in summary records including: Enumeration districts or block groups, census tracts, county subdivisions, places, counties, SMSA's, SCSA's, urbanized areas, States, and 5-digit ZIP Code areas.

Summary Tape File 4. STF 4 will provide more detailed sample population and housing characteristics data than will be available on STF 3. However, the geographic areas that will be shown on STF 4 will not include small areas such as enumeration districts. This file will include data for: Census tracts, American Indian reservations, Alaskan Native villages, places of 2,500 or more inhabitants, county subdivisions, counties, SMSA's, SCSA's, urbanized areas, and States.

Summary Tape File 5. STF 5 will provide detailed tabulations and cross-classifications of population and housing sample data. Geographic areas that will be shown in summary records or that can be aggregated from smaller units include: States, SMSA's, and large cities and counties.

Microfiche

In addition to data in print and on tape, 1980 census data will also appear on microfiche. Users will benefit in two ways as a result of this product. First, microfiche will save space. Rather than requiring 40 or 50 linear feet of shelf space, the whole collection of printed reports should fit into four 4 by 6 inch card files. Second, more data will be available on microfiche than in the printed reports. Besides the data that will be available from the printed reports, the Bureau plans to make some of the data from summary tape files also available on fiche. This will benefit the user who needs the type of data found on tape, but who does not have ready access to a computer.

AREAS SUMMARIZED ON 1980 SUMMARY TAPE FILES

	STF 1	STF 2	STF 3	STF 4	STF 5[1]
U.S., regions, divisions	US	US	US	US	US
State	X	X	X	X	X
SMSA's and SCSA's	X	X	X	X	X
Urbanized areas	X	X	X	X	
Counties	X	X	X	X	
Rural population by county	(2)	X	(2)	X	
Farm population by county				X	
Places (by population size):					
Under 1,000	X		X		
1,000 to 2,500	X	X	X		
2,500 to 10,000	X	X	X	X	
10,000 to 50,000	X	X	X	X	
50,000 and over[3]	X	X	X	X	X
Minor civil divisions or Census county divisions	X	X	X	X[4]	
Census tracts	X	X	X	X	
Block groups or enumeration districts	X		X		
Blocks	X				
ZIP code areas			X		
Congressional districts	X				
Indian Reservations	(2)	X	(2)	X	

U.S. Data are presented in separate U.S. Summary files in each series.

1. STF5 geography is subject to change.
2. Derivable by addition of component enumeration districts or block groups.
3. Also includes central cities with fewer than 50,000 inhabitants.
4. Only MCDs and CCDs with 2,500 or more inhabitants are included.

AREA SUMMARIZED IN 1980 REPORTS

			PHC	PHC	PHC			PC(1)			HC(1)	
	PHC(P)	PHC(V)	(1)	(2)	(3)	A	-B	-C	-D	-A	-B	HC(2)
U.S., regions, divisions	US	US				US	US	US	US	US	US	US
State	X	X			X	X	X	X	X	X	X	X
SMSAs and SESAs	X[1]	X	X[2]	X[2]	X	X	X	X	X[3]	X	X	X
Urbanized areas						X	X	X		X	X	
Counties	X	X	X[4]	X[5]	X	X	X	X	X	X	X	
Rural population by county						X	X	X		X	X	
Farm population by county								X			X	
Places (by population size)												
under 1,000	X[6]	X	X[7]		X[6]	X						
1,000 to 2,500	X[6]	X	X[7]		X[6]	X	X			X		
2,500 to 10,000	X[6]	X	X[7]		X[6]	X	X	X		X	X	
10,000 to 50,000	X[6]	X	X	X	X[6]	X	X	X		X	X	
50,000 and over[8]	X[6]	X	X	X	X[6]	X	X	X	X[9]	X	X	X
Minor civil divisions or census county divisions[10]	X	X	X[11]		X[12]	X	X			X		
Census tracts			X[13]	X								
Blocks			X									
Congressional districts	X	X										
Indian reservations[14]							X	X		X	X	

US Data are presented in separate U.S. Summary reports in these series.

1. Excludes any new SMSAs not existing prior to the census.
2. SCSAs are not shown in PHC(1) and PHC(2).
3. SMSAs with 250,000 population or more only.
4. Includes only those counties containing blocked areas.
5. Includes only counties which have census tracts.
6. Incorporated places only. Census designated places are excluded.
7. Only places or MCDs in which statistics are collected by block.
8. Also includes central cities with fewer than 50,000 population.
9. Central cities of SMSAs with 250,000 population or more only.
10. For MCDs in the 9 Northeastern States plus Michigan and Wisconsin data are also provided which parallel those of places in th size classes stated above.
11. Only MCDs in which data are collected by block, and only in 20 States where MCDs are functioning general purpose governments. No CCDs are shown.
12. Only those MCDs which are functioning general purpose governments are included. No CCDs are shown.
13. Census tracts in areas where there are no blocks are omitted.
14. Includes Alaska Native Villages.

Other Computer Tape Resources

Special Population Summary Prepared in Accordance with Public Law 94-171—This tape will be used for legislative reapportionment/redistricting purposes by providing counts for total population, major race groups, and persons of Spanish/Hispanic origin. Data will be provided for blocks, enumeration districts, block groups, census tracts, precincts (where applicable), places, county subdivisions, counties, and States.

Relationships Among 1980 STF's, Reports and Microfiche

Summary Tape Files	Reports PHC(P1) Preliminary Reports	Microfiche[1]
STF 1 Special Population Summary Master Areas Reference File	PHC(VI) Advance Reports PHC(1) Block Statistics PHC(3) pt[2] Summary Statistics for Governmental Units PHC(1)-A A Number of Inhabitants	Part or all of STF 1
STF 2	PHC(2) pt[2] Census Tracts PC(1)-B General Population Characteristics HC(1)-A General Housing Characteristics	(3)
STF 3	PHC(3) pt[2] Summary Statistics for Governmental Units	All of STF 3
STF 4	PHC(2) pt[2] Census Tracts PC(1)-C General Social and Economic Characteristics HC(1)-B Detailed Housing Characteristics	(3)
STF 5	PC(1)-D Detailed Characteristics HC(2) Metropolitan Housing Characteristics	(3)
Subject Reports STF's	PC(2) Population Subject Reports HC(3) Housing Subject Reports	

[1] In addition, microfiche will be prepared of every series of printed reports except PHC(P1).

[2] PHC(2) and PHC(3) reports include some tables based on complete count data and some tables based on sample data.

[3] No current plans for microfiche.

Master Area Reference File (MARF). This computerized geographic reference file (1970 counterpart: Master Enumeration District List) will contain records for the major summary areas in hierarchical fashion down to enumeration districts and block groups. It will contain population and housing counts plus a few additional items. Its special geographic features will include latitude and longitude coordinates for the population centroid for each area, and land area measurements for counties, places with 2,500 or more inhabitants, and census tracts.

Geographic Base File/Dual Independent Map Encoding (GBF/DIME). Some of the Bureau's map files are available in computerized form. The best known are the Geographic Base Files (GBF's) featuring Dual Independent Map Encoding (DIME). The GBF/DIME files are computerized versions of the Metropolitan Map Series with block-by-block address ranges, ZIP codes,and X-Y coordinate values at intersections. Each record in a GBF/DIME file identifies a segment of a feature on a map by its node points, address ranges, and geographic units (block, census tract, place, county, etc.) identified on both sides. The file covers the central city and contiguous populated suburbs of the SMSA and includes records for nonstreet map features, such as railroads, streams, and political boundaries, as well as streets. Files were updated or created for the 1980 census in 277 areas to geographically code the mail-out/mail-back questionnaire.

Public Use Microdata Samples (PUMS). Sometimes the data user prefers to create his or her own tabulations. This can be done using Public Use Microdata Sample files, extracted from the 1980 census. The name

GBF/DIME Files

Many organizations now use GBF/DIME files as analytic tools. For example, a city's parks and recreation department wishes to know how many children in the local school system live in each planning district and their distribution within that district to determine where new playgrounds should be built; the executives of a department store want to know in which census tracts their charge account customers live, as part of the planning for new branch stores. GBF/DIME files, along with related computer programs can be used to assign geographic codes carried on those files to any records containing local street addresses. After an organization's records (such as school enrollment or charge accounts) have been coded, they can be tallied for analysis, along with census statistics or other local data for the area.

Coordinates included in the GBF/DIME files can be used to produce computer-prepared maps or carry out a number of studies, such as resource allocation (for example, assigning children to schools) or network routing (e.g., for buses or garbage removal). If the user does not need precision down to the block level, then the computerized Tract Boundary Files or the County Boundary Files may be easier to use.

"microdata" refers to the fact that the file contains individual records from the census, which have had name, address, and all other identifying information removed. Public use microdata samples can be thought of as providing a "do-it-yourself" special tabulation capacity. In other words, if the user has specialized needs that call for cross-tabulations that do not appear in reports or on summary tapes, the user can retabulate the microdata to his or her own specifications (see chapter 14). There are, however, two limitations. First, only a small sample of records will be available, so public use microdata tabulations will not be as precise as published data. Second, only a limited amount of geographic information will be included on the household records to ensure that the confidentiality of the individual respondent will be protected even further. Thus, these files will identify only States, large SMSA's, and other subdivisions of States called county groups. These areas will be sufficiently large so as to preclude any possibility of individual disclosure.

Census Software Package (CENSPAC). This single software package has been developed for persons interested in using a standard package program oriented toward census files. This package will have the following capabilities: Create selective printouts, create extract tapes, merge files, add geographic areas together, and compute percentages and averages.

MAPS

Census maps are necessary for virtually all uses of small-area census data. They are needed to locate specific geographic areas and for analysis purposes. There are two general categories of maps that the Bureau produces: Statistical or legal boundary "outline" maps and thematic maps.

Outline Maps

Outline maps are produced to assist those who work with census data in locating the legal and statistical jurisdictions to which the data refer. These maps do not display any data in and of themselves, only the areas to which data can be related. Many of these maps are available separately from the publications in which they were originally included. Some of the maps that are available are listed below.

Metropolitan Map Series (MMS). Metropolitan Map Series cover at least the urbanized area portion of all of the SMSA's reported in the 1970 census. Each MMS sheet shows the names of streets and other significant features within the area covered. Boundaries and names (or numbers) of places, minor civil divisions, census county divisions, congressional districts, wards, census tracts, enumeration districts, and blocks are shown on MMS sheets. Block groups can also be ascertained from MMS'.

County Maps. County maps show those portions of metropolitan counties not covered by the Metropolitan Map Series and the entirety of those counties outside of SMSA's. Boundaries of MCD's, CCD's, places, congressional districts, census tracts, and enumeration districts are shown on county maps.

Place Maps. Place maps are available for every incorporated and unincorporated place reported in the 1970 census but not included on the Metropolitan Map Series. Place maps, which are usually based on maps supplied to the Census Bureau by local agencies, identify streets and show boundaries for places, minor civil divisions, congressional districts, and enumeration districts. Place maps also show census tracts where applicable and blocks if the place is participating in the block statistics program. Modified versions of place maps appear in the PHC(1) Block Statistics reports for places with a population of 10,000 or more inhabitants and places participating in the contract block statistics program, but they do not show enumeration district boundaries.

Tract Outline Maps. Tract outline maps show the boundaries, census tract numbers, names of counties, and of places with a population of 25,000 or more for all metropolitan areas tracted in 1980. Only streets and other map features that form census tract boundaries are shown on the maps. Generally, tract outline maps for an SMSA consist of one or two sheets but can range up to five sheets for larger SMSA's.

Urbanized Area Maps. Urbanized area maps show the extent and components comprising all the urbanized areas defined for the 1980 census with various gray shadings. Urbanized area maps appear in PC(1)-A *Number of Inhabitants*. More detailed delineation of urbanized area boundaries can be found in the Metropolitan Map Series.

County Subdivision Maps. County subdivision maps of States show the location, names, and the subdivisions of counties (minor civil divisions or census county divisions) as well as the location and names of all places that were recognized in the 1980 census. There is one map sheet for each State, with the exception of a few small States that have been combined on one sheet. The county subdivision maps, on a smaller scale, appear in sectionalized form in PC(1)-A *Number of Inhabitants.*

Thematic Maps

A thematic map presents the spatial distribution and relative magnitude of a given set of data; this comprises information collected by the Bureau's various censuses and surveys. The following maps are included in this group:

GE–50 series. At a scale of 1 to 5,000,000, this series shows data by county for the entire United States; that is, each county is shown with a color appropriate to the data interval in which it is classified.

GE–70 series. This is a specialized series of thematic maps at a smaller scale (1 to 7,500,000). One map in this series simulates the 1970 U.S. population distribution at night from a satellite. This effect was created by using a reverse printing process.

GE–80 series. This series displays, in atlas format, selected 1970 census socioeconomic characteristics by census tract for each of the 65 largest SMSA's. In each of the atlases, 11 variables are mapped individually and a 12th map is a cross-classification of 2 variables, education and income. This series will not be repeated as a part of the 1980 census program.

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PRINCETON AVE
STATE HWY

Segment of a Census Tract Outline Map

REFERENCE MATERIAL

1980 Census Users' Guide. Even though this chapter may seem to be rather extensive, it has only highlighted each of the data products to be available as a result of the 1980 census. The *1980 Census Users' Guide* will be the reference source to turn to for more information on all aspects of the 1980 census, from collection and processing methodology to products and services. It will be published during 1980 but, unlike the *1970 Census Users' Guide*, that will only be the beginning. The new *Guide* will be issued on a subscription basis so that users will automatically receive occasional updates and supplementary material.

A Primer on 1980 Census References and Guides

The Census Bureau issues several guides and other reference publications that should be of substantial help to 1980 census data users.

1980 Census Users' Guide—the primary guide for serious users of 1980 census data.

Data User News—the Bureau's monthly newsletter for data users. It reports on new publications and computer tapes, developments in Bureau services to users, upcoming conferences and training courses, and related matters. A subscription includes the quarterly supplement, **1980 Census Update.**

Bureau of the Census Catalog—issued quarterly with monthly supplements, the *Catalog* provides a comprehensive listing of all new publications, computer tape files, and special tabulations.

1980 Census Indexes—comprehensive subject-matter and geographic indexes to data tables from both published reports and computer tape files from the 1980 census.

DATA USER SERVICES

The Census Bureau offers assistance to members of the public and private sectors and research communities in accessing, understanding, and applying census data. The Suitland, Md., headquarters office, as well as regional offices of the Bureau, offer a number of programs aimed at improving user access to data and supplying training in data availability and use. Department of Commerce district offices and organizations such as Government and Census Depository Libraries, State Data Centers, and summary tape processing organizations serve the data user community at the State and local levels.

Local Data User Services

Given the variety of census programs and products, it is little wonder that data users need to be in contact with the Bureau to obtain both accurate and

Tentative Product Release Schedule

While the timing of the release of census reports cannot be projected precisely, general elements of the schedule can be discussed. Provisions of title 13 of the U.S. Code require that by January 1, 1981, the Bureau of the Census must transmit to the President the official State totals and the new apportionment of representatives among the several States. Public Law 94–171 requires that a special set of population summaries designed for use by States for reapportionment/redistricting purposes shall be issued by April 1, 1981.

The first population and housing data to be issued from the census will be preliminary counts tabulated in the 409 temporary census field offices. These data will be released locally and later published in preliminary reports to provide unofficial population and housing counts. Then starting around November 1980, a series of advance reports will be published. After the release of basic population and housing counts, the Census Bureau's efforts will turn to the tabulation of 100-percent characteristics (e.g., age, race, sex, Spanish/Hispanic origin, and tenure). Subsequently the Census Bureau will begin to process and tabulate the sample data. These products will be released on a State-by-State basis with data for some States being issued prior to others, depending on when the work for any given State is completed.

precise answers. Assistance from the main office in Suitland, Md., includes a variety of seminars and courses for users, telephone consultation, reference materials, technical documentation, and periodic publications (e.g., *Data User News*, a monthly newsletter). Several resources are also available at the local level to assist with individual data user problems.

Data User Services Officers

The 12 regional offices of the Census Bureau employ specialists called Data User Services Officers (DUSO's), who are trained to assist users in understanding and applying census data.

DUSO's have a thorough knowledge of the full range of Bureau products and serve as a resource in handling written, telephone, and walk-in inquiries on census products and availability. They maintain libraries of census publications and can direct users to organizations that sell census reports, offer summary tape processing services, or furnish other services suited to the user's needs. DUSO's can also be called upon to conduct classes and seminars and make speeches at conventions and meetings of local government agencies, colleges and universities, trade and professional associations, and community services groups. Because of their extensive contact with the data user community, DUSO's can effectively evaluate the utility of census products and services and submit recommendations to the national office on how to better meet user needs.

Special Tabulations

In spite of the tremendous amount of detail the Bureau will publish or produce on the Summary Tape files, it's inevitable that some specialized needs will not be met by these standard products. The Bureau, therefore, has the capacity to produce special tabulations for users on a cost-reimbursable basis.

Because the process involves retabulating the confidential basic record tapes, it can be performed *only* at the Census Bureau. The data provided to the user are in the form of tabulations that have been edited to exclude any information that could identify an individual. The output may be on printouts, computer tapes, or computer-output microfilm or microfiche. Once a special tabulation is created, it can then be made available to other users merely for the cost of reproduction.

State Data Centers

The State Data Center (SDC) program is designed to help State and local government officials, planners, researchers, business people, and community organization leaders make better use of statistical resources. Briefly defined, the program is a Federal-State cooperative effort designed to increase and improve public access to census statistical products. Under this program, the Census Bureau furnishes statistical products, training, and consultation to States, which, in turn, disseminate the products and provide assistance in their use.

Networks of substate affiliate data centers provide a linkage to councils of governments, local libraries, or university extension centers to extend the statistical resources of SDC's to local areas. Interagency councils established in participating States provide guidance to SDC's in identifying data needs, recommending new services, suggesting the development of new statistical resources, and designating affiliate centers.

Both SDC's and affiliate centers furnish a number of services to data users including: Census summary tape processing, inquiry handling and consultation, user training, library facilities, and analytical support for research, planning, and other applications of data. Affiliate centers vary in terms of services offered, but most provide basic reference collections and some consultation services for users.

National Clearinghouse for Census Data Services

A broad variety of public and private organizations listed with the Census Bureau's Clearinghouse of Census Data Services offer census-related services, such as training, summary tape processing, preparation of computer printouts, preparation of analytical reports, and computer mapping. However, there is considerable variation among these organizations with

A Primer on Data User Services

Specialists at the Bureau's Washington headquarters and 12 regional offices can provide answers to questions concerning Census data products and services:

Is the information I need available?

In what media is it available—on computer tape, in a printed report, on microfiche?

If it is on computer tape, who can I get to print-out tabulations for me?

For what geographical areas can I get the data?

How do I order the maps, tapes, or reports I need?

Workshops, conferences, training courses, and seminars are conducted at locations throughout the country. These educational and training activities introduce users in businesses, academic institutions, and government to Bureau programs, products, and services.

Washington contact: Data User Services Division, Bureau of the Census, Washington, D.C. 20233 (301) 763-2400.

Regional office contacts: Data User Services Officer, Bureau of the Census,

Atlanta, Ga. 1365 Peachtree St., NE, Room 638, 30309 (404) 881-2274.

Boston, Mass. 441 Stuart St., 8th Floor, 02116 (617) 223-0668.

Charlotte, N.C. 230 South Tryon St., Suite 800, 28202 (704) 371-6144.

Chicago, Ill. 55 E. Jackson Blvd., Suite 1304, 60604 (312) 353-0980.

Dallas, Tex. 1100 Commerce St., Room 3C54, 75242 (214) 767-0625.

Denver, Colo. 575 Union Blvd., 80225 (303) 234-5825.

Detroit, Mich. Federal Bldg. & U.S. Courthouse, Room 565, 231 West Lafayette, 48226 (313) 226-4675.

Kansas City, Kans. One Gateway Center, 4th & State Sts., 66101 (816) 374-4601.

Los Angeles, Calif. 11777 San Vincente Blvd., 8th Floor, 90049 (213) 824-7291.

New York, N.Y. 26 Federal Plaza, Federal Office Bldg., Room 37-130, 10007 (212) 264-4730.

Philadelphia, Pa. 600 Arch St., Room 9226, 19106 (215) 597-8314.

Seattle, Wash. 915 2nd Ave., Rm. 312, 98174 (206) 442-7080.

regard to what services are available and what census summary tapes are on hand. Also, charges for services vary.

To some extent, their services overlap those of State Data Centers. However, they often do not have the single State orientation associated with SDC's, and they frequently offer specialized services, such as market analysis, site location, geocoding, and address matching, that may not be available from SDC's.

Organizations listed with the Clearinghouse are not franchised, established, or supported by the Census Bureau. However, the Bureau maintains a list of all organizations that submit information about their processing services. This list is available to data users for their convenience in locating the best source of census-related services.

Depository Libraries

The Government Depository Library System, established by Congress, provides access to Federal Government publications for residents of every State and the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. Supplementing this system, the Bureau of the Census has designated Census Depository Libraries in areas not served by Government Depository Libraries. These libraries stock copies of basic census publications as well as series of publications selected to serve the specific needs of patrons.

SUMMARY

This chapter began by suggesting that the big payoff for the years of planning, the millions of dollars spent, and the public cooperation that go into conducting a census are the facts that result from the effort. A variety of products and services were highlighted that will be available to make this payoff a reality in the 1980's. Part IV, which concludes this book, provides examples of how data from previous censuses are used by the public sector, the private sector, and the research community. The payoff for the 1980 effort should be even more dramatic because of the addition of products and services that were formulated in response to needs for more racial, ethnic group, and small area data.

Reference

Silver, David E., and Catterton, Lucille D., "1980 Census Data Products and Coverage Improvement," *Statistical Reporter* (August 1979), pp. 279–288.

APPENDIX

GENERAL REFERENCE SOURCES FOR ACCESSING CENSUS BUREAU DATA

To help the potential data user gain access to the data, the Bureau prepares a number of general reference sources including catalogs, guides, and indexes. These publications are described briefly in the following annotated bibliography. It should be noted that all prices are subject to change. Be sure to ask for the current edition.

Catalogs

Bureau of the Census Catalog. $19.00 per year. L.C. Card No. 47–46253. (GPO No. C56.222/2–2:790–972). S/N 003–024–00110–1. This catalog consists of 4 quarterlies with monthly supplements.

There is also a one-volume comprehensive historical bibliography of sources for Bureau of the Census statistics from 1790 to 1972 comprised of two catalogs. *The Catalog of United States Census Publications, 1790–1945* was published in 1950 and lists all materials issued by Census Bureau and its predecessor organizations, starting with the first census report of 1790. The new *Bureau of the Census Catalog of Publications, 1946–1972* updates the historical compilation and describes more than 60,000 reports issued by the Bureau from January 1, 1946 to December 31, 1972.

Guides

Bureau of the Census Guide to Programs and Publications: Subjects and Areas, 1973. March 1974. $2.45. L.C. Card No. 73–600168. (GPO No. C56.208:P94). S/N 003–024–00196–9.

Provides a review of the Bureau's programs and activities for each subject area. Reports, represented in tabular format, are listed by title, geographic areas, and principal subjects.

Miri-Guide to the 1977 Economic Censuses. December 1978. $1.80. L.C. Card No. 78–600084. (GPO No. C3.6/2:Ec7/977). S/N 003–024–01640–1.

A valuable reference and guide to each of the nine economic census programs (censuses of: wholesale trade, retail trade, service industries, manufactures, mineral industries, construction industries, transportation, and outlying areas, and the enterprise statistics program) and to the data collected, geographic areas, publications programs, and Standard Industrial Classification System.

Guides to Governmental Statistics

Guide to the 1972 Census of Governments (Volume 8 of the 1972 Census of Government reports). February 1975. $5.00. L.C. Card No. 73-600080. (GPO No. C56.247/2:972/v.8). S/N 003-024-01004-6.

Gives a summary description of each subject volume from the 1972 Census of Governments, followed by separate sections that present the contents pages and table formats of each volume.

Guide to Recurrent and Special Governmental Statistics (State and Local Government Special Studies No. 78). April 1976. $3.20. L.C. Card No. 72-600104. (GPA No. C3.145:78). S/N 003-024-01177-8.

Summarizes the tabular presentations found in the most recent issues of the recurrent reports and special studies series of the Bureau's State and local government statistics program.

Recurrent Reports provide data on governmental finances, tax revenue, public employment, etc. *Special Studies* provide data on such topics as expenditure and employment data for the criminal justice system and national data needs such as fire service statistics. While this Guide presents only the most recent issues of the recurrent report and special studies series of the governmental statistics program, it may be used to generalize about prior and future publications.

Census Bureau Guide to Transportation Statistics. March 1976. $2.00. L.C. Card No. 76-60895. (GPO No. C3.62:T68). S/N 003-024-01179-4.

Describes the 1972 Census of Transportation and its three components—the National Travel Survey, the Truck Inventory and Use Survey, and the Commodity Transportation Survey. For each of the three surveys the Guide provides a general description of the survey method and design, reliability of the data, data contained in the published reports, selected tables and graphics, and facsimilies of questionnaires; also availability of unpublished data, description, and record contents of public use tapes, availability of survey results; and a general description of other surveys conducted by the Census Bureau.

Guide to Foreign Trade Statistics: 1975. July 1975. $4.05. (GPO No. C56/210/2:975). S/N 003-024-01082-8.

Describes content and format of individual reports, tabulations, computer tapes, punch cards, and microfilm—on exports, imports, and shipping statistics. Serves as a guide to various sources of foreign trade statistics, and to the content and arrangement of data. Expected to be updated winter, 1980.

Guide to Industrial Statistics. March 1978. $2.75. (GPO No. C3.6/2:IN2/976). S/N 003-024-01557-9.

Describes the industrial statistics program of the Bureau, with definitions for industrial classifications and geographic areas and terms used in publications, as well as locator guides for each of the industrial areas, such as manufactures and minerals, both census and current surveys. There is a section on energy-related industrial statistics, general references, and information on obtaining Census Bureau data.

Statistics Data Finders. (Series) issued irregularly, 1978. All copies 50 cents.

A series in tabular format, largely of programs from the economic fields, including energy statistics, describes reports from the areas of government, industries (manufactures, minerals), construction, agriculture, foreign trade, business (wholesale, retail, services), economic surveys (transportation, enterprise statistics, county business patterns, minority-owned businesses), and energy. All booklets include divisional contact names, and information on the title, series number, frequency of publication, type of data, level of detail, etc.

1970 Census Users' Guide, Part I and II. October 1970. Part I $2.35 and Part II $4.40. L.C. Card No. 71-610123. (GPO Nos. 6/2:C33/2/970-2/pt. 1 and C3.6/2:C33/2/970-2/pt. 2).

A two-volume guide to the 1970 Census of Population and Housing. Part I contains information on the background, collection, processing, and output (data products) of the 1970 Census as well as a users' dictionary and glossary of technical terms. Part II contains technical documentation on the 1970 Census First through Fourth Count Summary Tapes and the Address Coding Guides. Part II has limited availability.

Reference Manual on Population and Housing Statistics from the Census Bureau. February 1978 (Revised). $2.00. (GPO No. C3.6/2:P81/978).

Provides a comprehensive introduction to "demographic" data from the Census Bureau, as a starting point for the new or prospective user, and as a handy reference for the experienced data user. It includes subject content of the 1970 Census of Population and Housing, caveats and limitations of the data, printed reports, computerized products and related services, unpublished data on microfilm or printouts, current demographic data, reference sources, and a section on finding specific data.

Indexes

Index to 1970 Census Summary Tapes. March 1973. $2.60. L.C. Card No. 74-110406. (GPO No. C3.223:Su6/970/Ind.)

Index with cross-reference guide to all tabulations in all six "counts" of the 1970 census summary data, organized alphabetically by subject variable. Counts 1-5 are indexed in Section A; Count 6 is indexed in Section E. Helps identify and locate specific tables (on the tape) for specific subjects.

Index to Selected 1970 Census Reports. 1974. $3.70. (GPO No. C3.233:In2/970).

An index to the tables found in selected series of reports: Population Volume I; Housing Volumes I, II, and III; PHC I and II. Does not include "subject reports" (Volume II Population or Volume VII Housing) or other reports that provide national (but not State or small-area) data. Only final reports are indexed.

Statistical Compendia

Statistical Abstract of the United States, 1978. (First issued in 1889). $10.50 (cloth); $6.75 (paper). L.C. Card No. 4-18089. (GPO No. C3.134:978). Issued annually. Cloth S/N 003-024-01648-6. Paper S/N 003-024-01647-8.

Standard annual summary of statistics on the social, political, and economic organization of the United States. Also includes a guide to sources listing 800 publications. Footnotes provide additional sources.

County and City Data Book, 1977. May 1978. $19.50. L.C. Card No. 52-4576(496). (GPO No. C3.134/2:C83/977). S/N 003-024-01464-5. Issued every 5 years.

Presents data from the most recent censuses, and data from other government agencies and private sources. Provides statistical data for every county and city with a population of 25,000 or more, as well as metropolitan areas, States, regions, and census divisions. Contents are also available on computer tape.

Historical Statistics of the United States. Colonial times to 1970. Bicentennial Edition. September 1975. $26 per 2-part cloth set (sold only in sets). L.C. Card No. 75-38832. (GPO Catalog No. C3.134/2:H62/789-970/pt. 1-2). S/N 003-024-0120-9.

This compendium represents a 50-percent increase in the amount of statistical material contained in its 1960 predecessor. Its two volumes contain 1,298 pages crammed with more than 12,500 statistical series on subjects ranging from population and land area to production figures for crops and manufactured products. Of special interest in this bicentennial edition is the much expanded chapter containing data covering the colonial and pre-Federal period from 1610 to 1780.

Previously, many of these facts were available only by tracking down numerous volumes or manuscripts in scattered libraries throughout the United States and abroad. Over 300 pages of text cover definitions of terms, development and reliability of the data, and references to other sources.

Social Indicators: 1976. Prepared by the Office of Federal Statistical Policy and Standards, Department of Commerce. 1977. L.C. Card No. 77-608307. (GPO No. C3.2:SI/12:976). S/N 041-001-00156-5.

This compendium of government and privately collected statistics presents a comprehensive graphic collection of data selected and organized to describe current social conditions and trends in the United States. It contains indicators of the quality of health, education, housing, and family life, as well as the more widely reported income and population data.

The Bureau of the Census provided editorial and technical support for this report.

Presents a summary of first quarter employment and taxable payroll data by industry for each country, SMSA, and State. Beginning with the 1974 series, CBP data were collected and tabulated on an establishment, rather than a reporting unit basis as in the past. This means that each physical location of a multiestablishment firm is now counted separately. Data are presented by detailed kinds of businesses based on the revised 1972 Standard Industrial Classification (SIC) codes. Reports are issued for the United States, each of the 50 States and the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, and Guam.

Procedural Histories

A detailed description of procedures is prepared for each major census program. In many cases the procedural history provides operational definitions of concepts and coding not available elsewhere.

1970 Census of Population and Housing, Procedural History. (Series PHC (R)-1). June 1976. $8.50. L.C. Card No. 76-5793. (GPO No. C3.223.P94/2/970). S/N 003-024-01209-0.

Describes in detail most aspects of the 1970 census, from its early stages of research and planning through the tabulation, publication, and dissemination of the final results. The 17 chapters were issued originally in "advance issuance" reports prior to assembly, with minor corrections, in this volume.

There is a bibliography at the end of most chapters containing references to sources of detailed background information.

1972 Census of Governments, Volume 9, Procedural History. June 1975. $3.45. L.C. Card No. 73-600080. (GPO No. C56.247/2:972/v.9). S/N 003-024-01071-2.

A comprehensive report on the procedures and subject matter of the 1972 Census of Governments from early stages of planning through the tabulation and publication of final reports. Reports also include a brief description of the recurrent surveys and special surveys and services related to the census.

1972 Economic Censuses Procedural History. January 1976. $8.50 (cloth); $6.00 (paper). L.C. Card No. 75-600092. (GPO No. C56.202:EC7/2/972). S/N 003-024-01167-1.

A comprehensive report covering the history, scope, planning, geographic area coding, questionnaire mailing preparations, data collection and processing, special programs, and publicity and publications of the 1972 Economic Censuses. This volume also contains a special chapter on the 1972 Census of Transportation and eight appendixes which provide 1972 SIC changes, facsimiles of selected questionnaires, and other information.

Factfinder for the Nation: U.S. Bureau of the Census. Series CFF. Nos. 1-18. Issued irregularly, August 1976 to 1979. Price varies. (GPO No. C3.252.

Previously a single publication and last issued in 1970, the *Factfinder* now is being published as a series of topical brochures that may be used individually, in selected interest groupings, or as complete sets. Each brochure (usually four pages) describes the range of census materials available on a given subject, and suggests some of their uses. The subjects include: 1) minority statistics, 2) the availability of census records about individuals, 3) agriculture, 4) history and organization of the Bureau, 5) reference sources, 6) housing, 7) population, 8) geographic tools, 9) construction statistics, 10) retail, and 11) wholesale trade, 12) selected services, 13) transportation, 14) foreign trade, 15) manufactures, 16) minerals, 17) governments, and 18) Bureau programs and products.

Data Access Descriptions DAD's. Issued irregularly. Price per issue varies.

User-oriented, topical reports on accessing and using census data and products. Deals with such topics as census geography, 1970 census summary tapes, and delineation of problem housing areas. DAD's are numbered consecutively by date of issue (1 to 43 issued as of June 1979).

Data Users News (formerly titled *Small-Area Data Notes.* $4.00 for 12 monthly issues. (GPO No. C3.238:Vol.-Nos.).

Monthly newsletter which provides continuous reporting on plans or the 1980 census.

1970 Census and You. September 1977 (Revised). Free. (GPO No. C3.2:C33/27).

A general introduction to 1970 census data, giving a brief description of subjects, geographic areas, reports, tapes, and microfilm.

Census Data for Community Action. October 1978 (Revised). 50 cents (GPO No. C3.2:C73/7/978).

Information on how to use 1970 census population and housing data available for neighborhood or city blocks in community action programs such as the establishment of adult education programs.

Census Surveys Measuring America. February 1978. Free.

A brief (12-page) overview of the Bureau's major recurring current survey program.

We, The Americans. $8.30 for entire series. Price of individual issues (16-20 pages) varies from 40 cents to 85 cents. (GPO No. C56.234/1-15).

A series of 15 colorful booklets based on the results of the 1970 census. Although they are designed especially for students, they are of interest to everyone. All text is written in an easy-to-read style, using simple, colorful charts, graphs, and illustrations.

Public Use Samples of Basic Records from the 1970 Census-Description and Technical Documentation. April 1972. $3.00.

This manual and its supplements constitute technical documentation for computerized microdata (untabulated data consisting of disclosure free individual records for persons, households and neighborhoods) from the 1970 census. It includes detailed descriptions of all data items, their coding, concept definitions. Geographic, sample size, and technical options are discussed, as well as sample design, sampling variability, verification procedures, and other conditions affecting the use of the sample.

Directory of Federal Statistics for Local Areas, A Guide to Sources: 1976. March 1978. $5.50. S/N 003-024-01553-6. (GPO No. C3.6/2:St2/2/976).

Describes and cites individual tables from reports issued by the Census Bureau and other Federal agencies. Subjects and geographic areas smaller than States are displayed in tabular format.

Standard Industrial Classification Manual, 1972. Prepared by the Statistical Policy Division, Executive Office of the President, Office of Management and Budget. 1972. $8.80. L.C. Card No. 72-601529. (GPO No. PrEx 2.6/2:In 27/972) and 1977 supplement.

Defines industries in accordance with the composition and structure of the Nation's economy. Developed to promote the comparability of statistics describing various facets of the economy, the Standard Industrial Classification (SIC) Manual is revised periodically to reflect the changing industrial composition of the economy. The present revision is the first major one since 1957. The SIC Manual contains the titles and descriptions of industries, a numerical and alphabetic index of nonmanufacturing industries, a numerical and alphabetic index of manufacturing industries, and conversion tables for the 1972 and 1967 SIC industries.

College Curriculum Support Project

A number of materials have been prepared to assist college instructors and others in teaching students about census data.

a. *A Student's Workbook on the 1970 Census*. September 1978 (Revised). 55 cents. (GPO No. C3.2:C33/28/970/rev.). S/N 003-024-01642-7.

This pamphlet provides a general overview of the 1970 census subject matter, geography, and data products; mentions related current data sources; provides guidance in finding particular data; and includes several useful reference charts and exercises.

b. *Sample Kit of CCSP Materials*.

A Teacher's Guide describes the College Curriculum Support Project, objectives and techniques for use in teaching, illustrative uses of census data, and related materials. Case studies put data location and interpretation in a practical context. These and related brochures are included in a sample kit, available on request.

For Further Information

Telephone Contacts for Data Users. Revised as necessary. Free.

A listing of the names and telephone numbers of subject specialists within the Census Bureau in the demographic and economic fields, data user services, geographic matters, publications, field operations, and statistical and survey methodology.

Data User Training: Catalog of Training Activities. Free. Updated annually.

This publication lists course numbers and titles, locations and descriptions of subject matter covered, target audience, prerequisites, cost, and how to apply.

We Have the Facts You Need. Brochure. Free.

A check list/order form for Census Bureau publication announcements.

Publications Planned For The 1980 Census

Census Use Booklets.

Several booklets designed to introduce and provide guidance in applications of data to specific planning or problem-solving situations are to be issued in connection with the 1980 census. A revised version of *Census Data for Community Action* and booklets aimed at city planners, small business operators, persons concerned with affirmative action, and other groups are tentatively planned.

Report Release Dates

Report Number	Name	Release Dates
PHC(P)	Preliminary Population and Housing Unit Counts	Aug. 1980 – Oct. 1980
PHC(V)	Final Population and Housing Counts	Nov. 1980 – Feb. 1981
PCH(E)	Evaluation Reports	1982
PHC(R)	Procedural History Reports	1982
PHC(1)	Block Statistics	Jan. 1981 – July 1981
PHC(2)	Census Tracts	Sept. 1981 – Apr. 1982
PHC(3)	Summary Characteristics of Governmental Units	Sept. 1981 – Apr. 1982
PC(1)	Volume I. Characteristics of the Population (Clothbound consolidation of PC(1)-A and PC(1)-B)	1982
PC(1)-A	Number of Inhabitants	Dec. 1980 – Apr. 1981
PC(1)-B	General Population Characteristics	Feb. 1981 – Aug. 1981
PC(1)-C	General Social and Economic Characteristics	Sept. 1981 – Apr. 1982
PC(1)-D	Detailed Population Characteristics	
PC(2)	Volume II. Subject Reports	1982
HC(1)	Volume I. Characteristics of Housing (Clothbound consolidation of HC(1)-A and HC(1)-B)	Fall 1982
HC(1)-A	General Housing Characteristics	Feb. 1981 – Aug. 1981
HC(1)-B	Detailed Housing Characteristics	Sept. 1981 – Apr. 1982
HC(2)	Volume II. Metropolitan Housing Characteristics	Dec. 1981 – Sept. 1982
HC(3)	Volume III. Subject Reports	1982
HC(4)	Volume IV. Components of Inventory Change	1982
HC(5)	Volume V. Residential Finance	1982
STF 1	Summary Tape File 1	Nov. 1980 – July 1981
STF 2	Summary Tape File 2	Jan. 1981 – Aug. 1981
STF 3	Summary Tape File 3	Sept. 1981 – Apr. 1982
STF 4	Summary Tape File 4	Sept. 1981 – Apr. 1982
STF 5	Summary Tape File 5	Apr. 1982 – Sept. 1982
	Special Population Summary Prepared in Accordance with Public Law 94-171	Nov. 1980 – Apr. 1981
MARF	Master Area Reference File	Nov. 1980 – Apr. 1981
GBF/DIME	GBF/DIME Files	July 1980
PUMS	Public Use Microdata Sample	May 1982 – Aug. 1982
CENSPAC	Census Software Package	Jan. 1980

PART IV

USING CENSUS DATA

INTRODUCTION

David Kaplan, one of the principal architects of the 1980 census observed that "the census is no longer merely the source of interesting facts to put in the Statistical Abstract or an encyclopedia. It is now an action instrument which is critically involved in how the national pie—social, economic, and political—is cut. This new role for the census, and of the Bureau of the Census, has changed the nature of the job and therefore the professional lives of those of us who work at it. Our shadowy existence in a world of passionate anonymity is gone. The press and the public are beating a path to Suitland; so are mayors and Indian tribal leaders, the poor and the handicapped, the academicians and the planners, as well as the purveyors of statistical information, both retailers and wholesalers."[1]

The knowledgeable users of census data who are beating a path to Suitland come from three basic groups: The private sector, the public sector, and academia. Although the four chapters in Part IV illustrate the uses of census data within the university setting, the chapters also demonstrate the interrelationships that exist between academia on the one hand and the public and private sectors on the other.

Goldsteen's article on urban and regional planning provides several examples of census applications in the public sector, primarily at the local government level. Census data, according to Goldsteen, are used by planners to help perceive the future condition of the city and to make decisions about the city's future. This is consistent with planning's overall objectives of developing and assessing alternative scenarios for a city (or other governmental units). Census data are used for planning transportation routes, community action programs, public safety campaigns, and a number of other traditional planning functions described in detail in Chapter 11. For example, one important use of census data by planners is for the comprehensive planning process, which Goldsteen describes at some length. His table showing the uses of the 1980 census data illustrates the alternatives that are available for urban and regional planners, as well as for other data users in the public sector.

Census data are also used in calculating the distribution of Federal funds to States and local governments. As examples:

- The number of people, 18 and older, who have less than 5 years of schooling, determines the amount of money allotted to each State under the Adult Education Act.
- The number of children, 5 to 17, in poor families, determines the amount of money allotted to counties under the Elementary and Secondary School Act.
- The number of people unemployed, or with low incomes, determines whether a community is qualified for assistance under the Public Works and Economic Development Act.

Van Matre's chapter on applications in business is similar to Goldsteen's in that it has an applied orientation. He illustrates the interrelationship between the private sector and academia in several ways. The business manager often employs census data to reach decisions that enable the firm to operate more efficiently. Meanwhile, the academician uses census data to formulate and test new hypotheses concerning the economy and its various segments. The results of this research are often used, in turn, by management in the business community. Business applications include forecasting of demand, allocation of advertising, management of the sales force, and site selection. An important recent use of census data in the business sector, according to Van Matre, is to assist in the implementation of affirmative action programs. In an affirmative action employment report, an employer compares the minority or sex composition of his or her employees with corresponding characteristics of the labor force as a whole in an appropriate reference area. Federal regulations suggest that the use of two kinds of reference areas is appropriate: The immediate labor area and the area in which the employer could reasonably recruit. Thus, the firm must define its immediate labor area as well as potential recruitment area and then collect demographic information, by occupational classification, on minorities for each area. By comparing these statistics to statistics on employee composition, the employer is able to determine whether the firm is complying with Federal guidelines.

Many of the techniques discussed by Van Matre would be too sophisticated for some entrepreneurs. The following illustrations, however, provide additional opportunities for the use of census data in the private sector:

- A men's clothing store, planning to mail a circular to potential new customers, could use census data on income by ZIP code area to select areas having a high proportion of families and individuals in a specific income range.

- A lumber and hardware store, seeking a theme and potential customer needs to be the targeted in an advertising campaign, would find census statistics for its marketing area to be of value in determining such characteristics as age of housing, presence of basements, proportion of owner-occupied units, and family income.
- A market analyst, selecting a site for a new sporting goods store, would use census data for persons by age group, household composition, family and individual income, and other population characteristics to decide which area offers the most promising market for sporting goods.

Dent's article provides the reader with an overview of the divergent uses of census data in geography. Whereas some geographers have used census data to examine themes in urbanization from a historical perspective, census data have been used by other geographers to provide a spatial perspective for a variety of socioeconomic indicators. Whether atlases or maps are produced by census tracts for a city, counties for a State, or States for the Nation, mapping methodologies are available to examine regional patterns, spatial inequalities, and regional trends. Dent uses a case study involving quality of life indicators in Tampa, Fla., to demonstrate the manner by which census data and local data can be combined to examine problems faced by minority communities in many urban areas.

Finally, Poston's article on the uses of census data in demography and sociology provides an interesting balance to the applied orientations provided by Goldsteen and Van Matre. Few persons in the private and public sector would be interested in conducting a study to determine the differences in earnings between Anglo- and Mexican-American workers, yet the findings are extremely important to provide decisionmakers with objective information regarding inequalities among ethnic and racial groups in America. Poston's study is also important because it illustrates the use of the Public Use Microdata Sample (PUMS) as a microdata base for the 1960 and 1970 censuses. Although the PUMS is used extensively in sociology and demography, it has received scant attention within other disciplines.

Taken separately, these four chapters sample the variety of uses of census data in academia. Variations on these themes can be found within fields such as political science, history, and urban studies. Taken together, however, the chapters illustrate the commonality of approaches to the uses of census data. Consider, for example, that Goldsteen and Dent discuss the uses of census data to examine urban conditions or quality of life indicators. Poston's chapter provides a variation from Goldsteen's and Dent's topics by shifting the analysis from geographic units (e.g., census tracts, States) to individuals (e.g., Anglos and Mexican-Americans) so that differences in the quality of life (e.g., as measured by earnings) can be determined. Van Matre and Dent suggest that both disciplines use census data for locational or marketing analysis, and all of the authors suggest that census data can be used to improve our economic and social well-being at a variety of scales (e.g., Federal, local, personal, business). When combined with the use of the decennial data for reapportionment and redistricting, it is little wonder that applications of Bureau of the Census data permeate our daily lives.

Reference

1. Kaplan, David L., "America's National Portrait" *American Demographics*, Vol. 1 (1979), p. 11.

Chapter 11

CENSUS APPLICATIONS IN URBAN AND REGIONAL PLANNING

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INTRODUCTION

Information is the key to effective urban and regional planning. Without consideration of many sources of data, decisions about the future of cities, regions, and larger geographic areas cannot be made.[1] [2] Because of the related high costs of collecting and storing data, most governmental units, such as cities and regional councils of governments, rely upon Federal collection efforts, and the most complete, thorough, and carefully designed data sources are those made available by the Bureau of the Census.

One important issue that is often avoided by practicing professional planners is the relationship of census data to the purpose of planning. Understanding the purposes and functions of a public planning agency can give planners strong insights into data needs. The field of planning has a future orientation, wherein professionals are taught to develop the best future condition for a geographic unit or government unit, considering all of the variables affecting change.[3] Obviously, the quality, availability, and accessibility of data sets become important factors in order for the planner to (1) develop strategies and tactics, (2) be able to perceive the future condition of a city and (3) make decisions about a city's future. Since cities and regions are composed of social groups, often holding competing desires, values, and goals, there is often a need to substantiate planning decisions with data to combat the politics resulting from the competition for scarce resources.[4]

Planners are becoming increasingly quantitative in their urban analyses and more and more professionals are starting to work with Census Bureau data. Although some planners use the Bureau's economic censuses and survey data to enrich their planning activities, by far the most frequently used set of information is the decennial census of housing and population.[5]

Census data are used by local planning agencies that are involved in transportation planning, community action planning and programs, public safety, education, housing planning and redevelopment, and area planning. In response to a 1967 Census Use Study, 29 local agencies stated that their major data source for small areal units (e.g. school districts, police precincts, and health districts) was census data.[6] More smaller-unit data will become available with the 1980 census, since there will be more SMSA's to be divided into census blocks. (In previous censuses, limited data had been published for blocks in the urbanized areas of SMSA's.) Converting the data into perceptual neighborhoods, or planners' neighborhoods, has been a difficult problem for many years. Because tabulated data for census blocks were limited and perceptual boundaries frequently did not coincide with other census geographic units and physical features (e.g., cliffs, hills, railroad tracks), city planners could only approximate or guess the census variable values for their neighborhoods.[7] With the additional blocks of the 1980 census, more cities will be able to use these tabulated data for planning purposes.

Some cities, such as Dallas, Tex., are developing sets of city indicators to produce an instantaneous assessment of urban conditions.[8] In addition to census variables, local data sources are used (e.g., police records, water department connections, health statistics, and building inspection records). With this set of urban indicators, variables coming from city records are more dynamic because they are frequently updated. The census variables are more static, they remain constant in the computer data files until the decennial updating by the Bureau of the Census. One of the disadvantages of using census data for planning is the contrast between the dynamics of regularly updated, city-generated information and the potentially decade-old census information. Yet, new advantages for planning should be realized by using these variables as urban indicators because a range of values can be established and changed as needed to flag critical indicators that affect different parts of the city. For example, in the instance of city-generated data (e.g., building conditions) a range of 10 to 25 percent deteriorating or dilapidated structures can be predetermined as critical and an asterisk or underscored number can be programmed to appear in computer printouts or on cathode ray tube screens. In this manner, transitional areas can be closely monitored with the city-generated data and compared with the more extensive and complete census data.[9] [10]

Table 11-1. Census Items and Selected Planning Considerations

(Commonly used indicators for city planning are given on a small-area basis, planners can examine census blocks and tracts to obtain information about their cities and their social, economic, and physical structure)

CENSUS VARIABLE	INDICATES
Household Relationship	Number of families per dwelling unit
	Number of people per family
Race	Racial distribution
	Boundaries of minority neighborhoods
	Places where cultural differences may be observed
Age	Elderly (over 65)
	Youth (under 18)
	Potential workforce
	Number of women of childbearing age
	Potential social services targets
	Land use needs, such as schools, playgrounds, etc.
Sex	Composition of workforce
	Number of women of child-bearing age
	Predominance of female heads of households
Marital Status	Lifestyle
	Composition of workforce
	Potential social services targets
	Expected children in future to use open space and recreation

Table 11-1. Census Items and Selected Planning Considerations (Cont'd)

CENSUS VARIABLE	INDICATES
Spanish/Hispanic Origin or Descent	Areas of bilingual character Specialized education/target areas
State/Country of Birth	Inmigration /outmigration Ethnicity and enclave identification
Educational Attainment	Composition of workforce Occupation Potential social services Expected political activism
Number of Children Ever Born	Birthrate Mortality rate
Activity 5 Years Ago	Composition of workforce Workforce patterns Social mobility
Employment Status Last Week	Composition of workforce Unemployment State of the economy

Year Last Worked	Child-rearing activities
Hours Worked Last Week	Unemployment Underemployment Composition of workforce
Travel Time To Work	Commuting patterns and trends Residence/work adjacencies
Weeks Worked Last Year	Unemployment Underemployment Composition of workforce State of the economy
Industry, Occupation, Class of worker	Composition of workforce Lifestyle Income Potential social services Patterns by type of labor
Weeks Looking For Work in 1979	Unemployment Underemployment Composition of workforce State of the economy
Amount of Income Last Year by Source	Composition of workforce Poverty level Disposable income
Ancestry	Migration Patterns

Table 11-1. Census Items and Selected Planning Considerations (Cont'd)

CENSUS VARIABLE	INDICATES
Current Language and English Proficiency	Migration patterns Areas of bilingual character Specialized education/target areas
Place of Residence 5 Years Ago	Mobility Inmigration/outmigration Transiency measures
School or College Enrollment/Public or Private	Potential social services
Veteran Status and Period of Service	Composition of workforce
Place of Work	Commuting time Employment centers
Means of Transportation to Work	Potential service need Land use factors related to travel
Persons in Carpool	Commuting patterns Environmental planning potential Mass transit demands

(Occupation/Industry) Activity 5 Years Ago	Social mobility Nature of workforce Structure of the economy
Citizenship and Year of Immigration	Migration/mobility Ethnicity and enclaves
Marital History	Family stability
Presence of Disability or Handicap	Number of handicapped Type of handicapped Potential social service needs
Year Moved Into This House	Mobility Inmigration/outmigration Transiency measures
Number of Units at This Address	Type of housing structure Degree of crowding
Complete Plumbing Facilities	Measure of housing quality
Kitchen or Cooking Facilities	Minimum housing standards
Complete Kitchen Facilities	Minimum housing standards
Number of Rooms	Rooms per household
Tenure (Whether Unit is Owned or Rented)	Percentage of households that are renter/owner

Table 11-1. Census Items and Selected Planning Considerations (Cont'd)

CENSUS VARIABLE	INDICATES
Condominium Identification	Ownership/renter
Value of Home (Owner-occupied Units and Condominiums)	Quality of neighborhood Availability of housing
Contract Rent (Renter-Occupied Units)	Quality of neighborhood Availability of housing
Vacant for Rent, For Sale, etc.,; and Period of Vacancy	Housing availability Housing quality Quality of neighborhood
Homeowner Shelter Costs for Mortgage, Real Estate Taxes, and Hazard Insurance	Irrelevant at city level Housing cost comparisons at regional and comparative level
Heating Equipment	Minimum housing standards
Year Structure Built	Age of housing stock Building conditions

Number of Units in Structure	Type of housing structure
Type of Unit	Type of housing structure
Acreage and Crop Sales	Characteristics of community
Source of Water	Characteristics of community
Sewage Disposal	Characteristics of community
Number of Bathrooms	Minimum housing quality
Air Conditioning	Comfort/convenience and modernization
Number of Automobiles	Type of transportation service/need Level of affluence
Number of Light Trucks and Vans	Estimates of leisure time pursuits Cultural preferences
Stories in Building and Presence of Elevator	Characteristics of structures
Fuels Used for House Heating, Water Heating, Cooking	Energy sources
Costs of Utilities and Fuels	Required upkeep and expenses
Number of Bedrooms	Measure of overcrowding

Source: K. Alex Newman, Sara E. Sweetser, AICP, Joel B. Goldsteen, AICP

Additional consideration must be given to other sources of data that are generated by the planning department or other public agencies. These additional sets of locally generated data may be added to the aggregate data (census data) to develop cross-comparisons. An extensive treatment combining census data with community opinion data (citizens' goals) and professional judgment data (observational information) can be examined in a recent work by Goldsteen.[11] In the past, other studies were completed using single-variable maps[12] to define social areas. In this 1920's effort, single social characteristics, such as income groups, were displayed on maps to more easily comprehend the pattern of the many census tracts of the city. Later studies in the 1940's had more detailed census tract data.[13] [14] In Shevky and Williams, census tract differences in the metropolitan area of Los Angeles were developed into three indices of tract characteristics: Social rank, urbanization, and segregation. Combinations of census variables, alone, comprised the indices. These early social science research efforts were structured to use census data as a single source. Combinations of data sources were not employed in these early decades of research, yet important hypotheses have developed from their efforts forming the basis for social science research and a dominant belief in the field of planning; that is, persons living in particular types of social areas are different from persons living in another type of social area with respect to their characteristics as well as their attitudes and behaviors.[15]

From these early studies, the spatial form of the city was perceived as a changing, dynamic system. As a single variable (e.g., the mean income) was noted to change over time, other variables were seen to be systemically affected. Patterns among cities were noted and social characteristics across geographic areas were discovered by sociologists, demographers, and geographers; however, most of the applications of their work to every day urban affairs have been implemented by professional planners. The planner, as a technical expert to the executive branch of the municipal government, often serves as a data analyst. By developing and applying data, a planner works at substantiating decisions. Forecasting and making projections becomes one of the important end uses of a planner's data.

COMPREHENSIVE PLANNING PROCESS

One way in which to look at the use of information in planning is to consider the comprehensive planning process.[16] As a basic policy guide for the application of implementation procedures and other decisions for the future, the comprehensive plan document is produced by city planners to indicate a desired goal for the future physical, social, and economic city. The plan is considered to be a snapshot in time with a horizon of 15, 20, or 25 years. Elements of the plan (land use, housing, transportation and traffic, historic preservation, environmental and energy, open space and recreational, and social factors) vary in name and in quantity of treatment among cities; but certain elements do remain constant in their content as a result of Federal and State restrictions linked to funding grants for planning.[17] The following examples illustrate the use of census data in each element of a comprehensive plan. In addition, consideration is given to the use of census data in developing the capital improvements budget.

Land Use

Decisions about the future land use of a city may be based on various types of census information. A mosaic of patterns representing different uses (e.g., housing, industrial, commercial, and institutional) can be drawn on a map to represent land use. Usually, the myriad of different uses produce previously undiscovered adjacencies. Some cities may appear to have incompatible land parcels adjacent to otners, such as heavy industry next to expensive residential areas or commercial stores spotted within housing areas. A dynamic city must be planned for the future, and the planner needs to allocate increases or decreases in land areas for growth and change. If the total population of a city is declining, then existing land use, such as vacant commercial and industrial buildings, may need to be planned for less intensive use. To uncover this information, a planner may study printed census data by census block or tract to determine the present population. If there are no residents within the block or tract, the planner may elect to review data from surrounding blocks. If resident income or other socioeconomic variables cannot be related to the commercial or industrial site under review, then clearance strategies may be best adopted by the planning agency, or a new land use category may be recommended to eventually replace existing sites and buildings. This latter strategy has been successfully used in many cities resulting in a conversion to lower density, alternative land uses.[18]

Of course, in the above example, other methods can be utilized to examine information. In planning, there is continuous need to assess competitive requests for city investment. For cities with limited resources, planners must examine conditions based upon empirical (or observable) data. If the target area has a set of unique conditions or functions, then plans for city investment may legitimately be adopted. Census data can be used to obtain information about the economic base of a city and the trends in its neighborhoods. For example, if a city's economic base is primarily medium or heavy industry (e.g., Detroit, Mich., or Gary, Ind.), then land use areas may need to be reserved for expansion. It is possible that conditions of declining population could still produce a need for industrial expansion. Surrounding areas that presently contain deteriorating or dilapidated residential structures may best be planned to be converted for industrial use. The use of census data can assist the planner in developing his/her case.

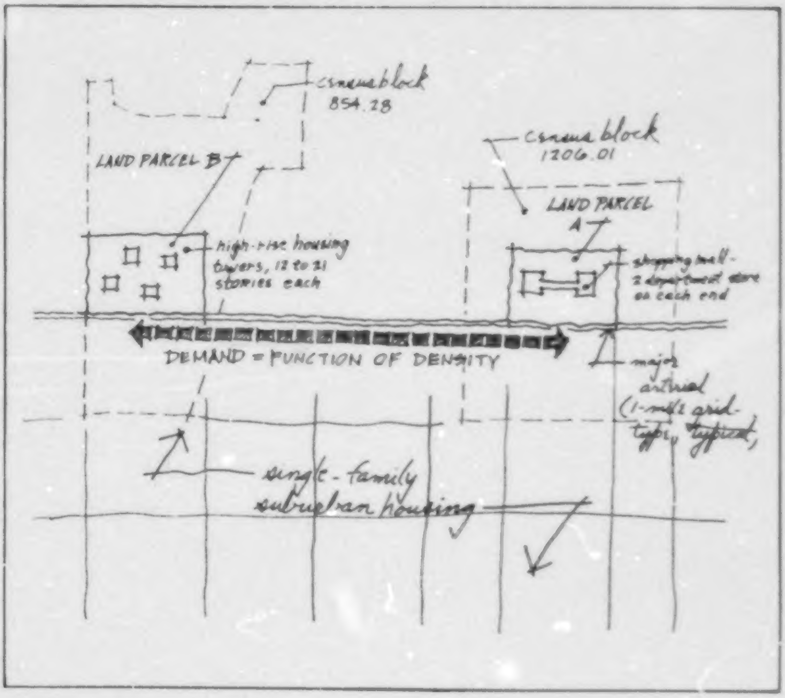
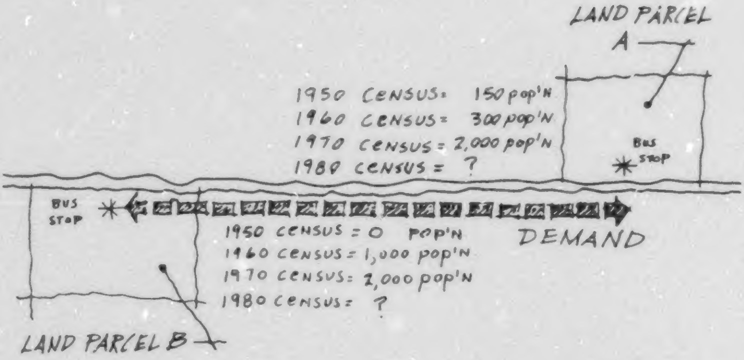

census block
854.28
census block
1206.01
LAND PARCEL B
LAND PARCEL
A
high-rise housing
towers, 12 to 21
stories each
shopping mall -
2 department store
on each end
DEMAND = FUNCTION OF DENSITY
major
arterial
(1-mile grid-
typi, typical)
single-family
suburban housing

Figure 11-1. Travel Demand as a Function of Density Using Census Block Data.

Traffic and Transportation

Increasingly, there is realization that the residential uses of land are related to traffic volume. The greater the density of population, the heavier the traffic generated. [19] As a result of this transportation/land-use interdependency, the reader can begin to understand the purpose and intention of the comprehensive planning process. One single variable cannot be manipulated within a city without affecting many others. In this era of energy scarcity, planners are preparing for a heavier reliance upon mass transit. During the 1960's and 1970's, transit companies were plagued by decreasing ridership, which has been attributed to a number of factors. One of the primary reasons that there are few bus routes throughout our contemporary suburbs is that low density single-family homes cannot generate enough rider-trips along their routes to be profitable or to break even. [20]


LAND PARCEL
A
1950 CENSUS= 150 pop'N
1960 CENSUS= 300 pop'N
1970 CENSUS= 2,000 pop'N
1980 CENSUS= ?
BUS STOP
BUS STOP
1950 CENSUS = 0 POP'N
1960 CENSUS= 1,000 pop'N
1970 CENSUS= 2,000 pop'N
1980 CENSUS= ?
DEMAND
LAND PARCEL B

Note: If 1980 population can be projected to be 3,000, Ajax Tansit Co. will initiate a new bus route in 1979.

Figure 11-2. Transit Stop Decisions Using Census Block Data.

The widening and improvement of roads and highways can be coordinated by studying patterns and trends with census-based data (e.g., housing types, population, and socioeconomic variables) and by making projections from the patterns. If changes can be expected for an area of a city based on an analysis of the data, then roads may need improvement. Census tracts, or blocks, with high densities are those that generate traffic. From this consideration, points of high density (i.e., those areas or census blocks that have large populations) can be considered as origins or destinations for travel. A regional shopping mall and a high-rise housing complex are good examples. Demand can be mathematically projected based on the census data, and street and highway improvements can be timed and phased for construction. This example can best be examined in fig. 11-1. Travel demand can be seen as a function of the ability to generate people trips between the two places. In fig. 11-2 projection of population trends for land parcels A and B (census blocks) indicates that bus service can be initiated by a transit company as soon as the estimated population reaches 3,000.

Energy Consumption And Utility Provisions

Still another use of census data in urban and regional planning is planning for energy needs. Utility companies do considerable planning for the future to maintain the needed generating capacities to service their customers. However, much of their investment planning for new equipment is strongly related to their abilities to obtain rate increases from various governmental units.[21] In this era of heavy governmental regulation, planning departments may be called upon to substantiate utility plans. To determine the energy needs for an expanding or changing population, planners need to study demographic indicators, such as income, population trends, number of nonworking householders (to determine those consumers that will be generating demand during the workday by remaining in their homes), number of units at the address, kitchen or cooking facilities, heating equipment, air conditioning, and fuel for heating, cooking, water heating, and appliances.

From another viewpoint, planners may need to examine power availability to consider the potential for future land development.[22] Obviously, one of the key factors affecting this kind of decisionmaking is population and housing facts combined with methods of projective analysis (e.g., simulation and modeling to develop projections of future population).[22] Trends need to be examined over previous census years to determine the direction of growth or change in the city.

Projective Analysis

The following example is provided to show one method of projective analysis. It pertains specifically to the procedures one might follow when examining population trends to determine energy needs. They are:

1. Examine census reports on population and housing variables for the tract level over the years 1940 through 1970;
2. Record, map, and note those tracts where changes have occurred;
3. Transfer the boundaries of utility companies' service areas to a map of the city;
4. Note where increases may occur within the utility company's service area;
5. Consult with appropriate utility companies' personnel to determine their ability to supply those census tracts where population increases can be predicted;
6. Discuss implementation procedures, programs, or required slow-growth or no-growth controls on development for those areas with appropriate city leadership; and
7. Recommend the adoption of plans for implementation and required programs.

Housing

Housing condition is a physical state that describes standard, deteriorating, and dilapidated structures. Areas of a city are often generalized as "deteriorating neighborhoods" or "older housing stock" when a predominance of the two substandard categories exist. By utilizing census information, housing patterns may be uncovered that may counter intuitive notions, save staff time in conducting building condition observational surveys, and give planners an empirical description of neighborhood conditions. For example, in a volume entitled, "Socioeconomic Indicators of Housing Condition," census variables were extracted to attempt to predict physical housing conditions.[23] [24]

Certain Federal agency requirements for planning, such as housing planning requirements by the Department of Housing and Urban Development, specify that low- and moderate-income housing dispersal plans and strategies for implementation must be developed for each community.[25] This national housing policy of dispersal is based on a desire to give low- and moderate-income people a choice in their housing location, so that ghettoization does not become the only alternative. To know whether or not dispersed patterns of low- and moderate-income housing already exist in their city and where those areas are located, planners often examine census information as a sole source. Only after an inventory of low- and moderate-income areas can dispersal plans be decided. Commonly used census variables for this purpose are: Employment status, occupation, income, place of work, contract rent, vacancy status, components of gross rent, and bathrooms (often seen as a measurement of income according to the number of bathrooms in a residence).

Citizen Participation For Neighborhood Planning

A major requirement of planning is citizen participation. Requirements for planners to work closely with residents are often mandated as a condition to receiving Federal aid from various agencies (e.g., the Department of Housing and Urban Development, the Department of Transportation). Through a process of citizen participation, the planning agency often becomes a major data-collection source by introducing neighborhood viewpoints into the governmental process. These opinions are referred to elected officials by the planning agency, after collection through a process of neighborhood meetings, questionnaires, or survey interviews.[26] Census data are used by many professional planners to locate areas of their city where neighborhood groups need to be developed. Most often, the planner believes that middle and upper income residents have more available resources to form their own groups or have easier, more frequent access to local public officials in order to make their opinions known. For this reason, planners consult census data to obtain socioeconomic information about their city and to develop target areas for community participation. Then, neighborhood planning becomes an advocacy planning activity, wherein the professional planner acts as a technical advisor to resident groups in promoting their real and perceived needs to other public officials. Also, census data are used to substantiate resident desires, goals, and objectives. For example, requests for more police protection related to complaints about transient residents committing crimes can be substantiated from variables such as "place of residence 5 years ago" and "year moved into this house." Likewise the need for better public transportation can be substantiated by using the variable "means of transportation to work."

A planner, for methodological reasons, often views neighborhoods as groupings of census blocks (or tracts). Even if the neighborhood boundaries do not coincide with census boundaries, a planner will tend to use only those variables of the census as descriptors of the neighborhood under study.[26] In those cities where census boundaries do coincide with neighborhood boundaries, composites of census variables are developed as descriptors of neighborhood condition. Since areas containing housing consume most of the total land area of many cities, the socioeconomic data available from the census of housing and population needs to be closely linked with aspects of citizen participation, community opinion, and neighborhood planning. The allocation of limited city resources can best be made by examining that neighborhood's city context against all of the other neighborhoods of a city. In this manner, other neighborhoods can be scheduled for planning, knowledge can be obtained concerning the intensity of need throughout a planner's jurisdiction, and implementation documents (e.g., the capital improvements' budget) can be rationally developed.

Capital Improvements Budgeting

Usually, cities allocate expenditures by a yearly schedule called a "capital improvements plan(CIP)." The CIP lists various amounts that should be spent to ensure implementation of the comprehensive plan. Census data may be examined to determine the social, economic, and physical conditions of areas of the city to avoid overlooking places that need immediate attention. Variables such as plumbing conditions and persons per unit may be important indicators of conditions that need city investment in new construction and of programs that give residents matching funds for home improvements. Planners may even wish to supplement political decisions with census data to support the need for public investment.[27] Not only can computer census tapes and printed census materials be used to generate these data for sections of a city, but computer mapping is commonly used. The mapping of census data facilitates the identification process so that comparisons of census items can be easily developed through agency designed or package-computer programs (e.g., EZMAP, ADMATCH and UNIMATCH).[28] Often, planners prefer to use visual displays of maps as supporting documentation. While CIP's and budget documents do not normally contain supporting documentation, many planning agencies do maintain maps and data in their files for public examination to support budget allocations.

SUMMARY

The above elements of the comprehensive plan and capital improvements budgeting are selected, though representative, examples of the use of census data in planning. As a description of the planners' reliance on federally generated information, this discussion was intended to substantiate this reliance on the application of census data in city and regional planning. Primary emphasis centered on how planners use data from the census of population and housing (table 11-1).

Professional planners need to be acquainted with other products of the Bureau of the Census, including data available only in current population reports, annual housing surveys, and the economic censuses. Planners also need to employ economical methods of data collection. Supplemental sources of data can be combined with census variables to produce city indicators. Specifically, most planning agencies perform building condition surveys, opinion surveys, and fiscal impact analyses. Methods of analysis for combining this information are part of a planners' repertoire.[29] [30] [31]

It should be noted that new methods of analysis and new sources of data are appearing in planning. The growth in computer capabilities in many cities and other governmental agencies is adding to the potential for manipulating planning information. Applications of census data are especially popular with quantitative methods' planning specialists in the area of modeling and simulation. By constructing alternative future scenarios, planners can begin to better understand the implications and consequences of their proposals. proposals.

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Chapter 12

USE OF CENSUS DATA IN BUSINESS

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Data from the 1980 Census of Population and Housing and other censuses provide information indispensable to those concerned with the operations of business in today's society. The business person, as practitioner, often employs census data to reach decisions that enable the firm to operate more efficiently. The academician also uses census data to formulate and test new hypotheses concerning the economy and its various segments. Unions, legislatures, and regulatory authorities all find census information useful in their decisionmaking processes. In this chapter, some of the more frequent applications are discussed briefly, and a number of references are provided for the interested reader.

Decisionmaking in today's business world involves an increasingly analytical component and reliance on factual information. Why? First, the computer has given management the means to quickly and inexpensively process vast quantities of information. (Similarly, the computer enables the Bureau of the Census to provide data that are both more detailed and timely.) Second, today's managers comprise a highly trained, professional group with the skills necessary to utilize quantitative data. The American Assembly of Collegiate Schools of Business (AACSB), the accrediting body for business schools, requires students to have "a basic understanding of the concepts and applications of accounting, of quantitative methods, and information systems."[1] Thus, many recent business school graduates have the background to effectively use data and data processing equipment as management tools.

The following discussion does not present an exhaustive list of census data applications to business and economic problems. Nevertheless, the reader should gain some insight into the variety of business uses for census data.

FORECASTING

Forecasts play a pivotal role in corporate planning. Firms whose products are sold primarily for specific age groups (e.g., diapers, roller skates, or dentures) analyze the trends in relevant age groups using census data. The forecasts are used to aid the firm in planning additional manufacturing, sales, or service facilities. Of course, the construction of some facilities (e.g., nuclear power plants) must be initiated many years prior to the additional capacity being required. The time and investment demanded by such projects underscore the need for reliable forecasts.

Forecasts of company performance are discussed by Parker and Segura in the *Harvard Business Review*.[2] One example they cite is how the American Can Co. forecasts beer-can demand. These forecasts use regression analysis to estimate sales using income levels, number of drinking establishments per thousand persons, and age distribution of the population as independent variables. In a detailed illustration, Parker and Segura develop a model for forecasting sales of a company in the home furnishings industry. The variables used in the model were housing starts, disposable personal income, and new marriages. The authors indicate the advantages of scientific approach to forecasting as opposed to intuitive, nonanalytical methods.

PERSONNEL MANAGEMENT

Personnel directors and managers have witnessed a tremendous change in their duties and responsibilities during the last decade. In earlier years, personnel decisions such as employee selection, performance appraisal, and salary and promotion recommendations were made on the basis of the internal policies of a company or government office. These practices were considered, for the most part, the private affairs of the organizations. However, dramatic changes occurred following the Equal Pay Act, Title VII of the Civil Rights Act of 1964, and other legislation relating to discrimination in employment. Now Federal agencies such as the Department of Labor and the Equal Employment Opportunity Commission (EEOC) issue guidelines that must be adhered to for many personnel decisions. Compliance with the various regulations has increased the volume of data that must be recorded and analyzed. Rather than merely reacting to demands by compliance agencies, the effective personnel administrator spends time designing reports that not only meet Federal guidelines but also alert management to patterns, trends, and exceptions of employee data. This not only alerts management to compliance difficulties prior to investigation but also allows them to ensure that internal policies and objectives are being met.

Title VII of the Civil Rights Act of 1964 prohibits discrimination in all terms, conditions, and privileges of employment. The evidence most frequently presented by plaintiffs in employment discrimination suits is in the form of comparative or demographic statistical exhibits (e.g., sex, age, race) that show disparities between the protected group for which the plaintiff is a member and the remainder of the work force. For example, a large metropolitan city was ordered to change its hiring practices when the court found a gross disparity between the percentage of minorities in the city and the percentage of minorities employed by the city's fire department. The census of population and housing provides data vital to the resolution of such litigation. In past cases, the percentage of minority workers employed and the percentage available for employment have been compared within a city, SMSA, county, State, or other hiring area for the company.

To quote Holley and Field:

> Because the expenses of not complying with the legal requirements of equal employment opportunity are exorbitant, management at all levels must be cognizant of the current legal status of the more pertinent personnel practices. This importance becomes even more apparent in organizations when the percentage of minorities in the work force is disproportionately low when compared to that of the population. Thus, when this disparity occurs, the burden of proof shifts to the employer to show justification and validity of their personnel practices and to show that those personnel practices are bona fide occupational qualifications. In the event that the organizations cannot show justification and validity, they often bear enormous costs.[3]

Today's managers must detect and rectify discriminatory patterns and practices because of their social responsibilities as well as the expense of litigation. Census data are indispensable to the personnel administrator effectively fulfilling these responsibilities.

ADVERTISING

Advertising is an integral part of the marketing effort of firms in a competitive environment. And, since advertising budgets are limited, the dollars must be effectively allocated among media and/or geographic regions. The measurement of market potentials is often used in the allocation process, and the corollary data method is a popular technique for measuring markets. The method determines market area factors (e.g., number of consumers) that are related to sales of the firm's products. The census of population and housing provides factors (e.g., number of residents, age, income, home ownership) that are frequently used in the corollary data method.

Direct mail campaigns offer relevant illustrations of the allocation problem. The process usually begins with an analysis of the firm's present customers.

After determining characteristics of current customers, the firm can selectively mail promotional literature only to areas that contain a large proportion of individuals with the desired characteristics. For example, McCann reviews the case of a nationwide retailer of auto and home repair items.[4] The firm took a sample of customers and determined that individuals with very high or very low incomes or living in apartments were not likely consumers of their products. The firm then used census tract data to determine the areas of greatest potential within each store's trading zone. The selected areas had high proportions of middle income families who owned their homes. McCann notes:

> Because this was a nationwide chain, the cost of an individual market study for each store would have been prohibitive. The existence of census tract data made it possible for the analysts to accomplish the task inexpensively and to approach the problem on a uniform basis throughout the country.[5]

Finally, the importance of census data in this regard is best emphasized by quoting the president of a mail advertising corporation, "We literally live with census data in our daily business operation."[6]

SALES FORCE MANAGEMENT

Marketing management has made effective use of census data in planning and controlling marketing operations. For example, sales territories must be established for firms selling in a broad geographic area. When carefully established sales territories are introduced, selling costs may be reduced, customer relations may improve, and the morale and effectiveness of the sales force is increased. Service firms (e.g., life insurance), manufacturers (e.g., computer equipment), and hospital supply distributors are all concerned with this problem. A related problem for many businesses is the establishment of sales quotas. Quotas are used to furnish realistic goals for the sales force and to control and evaluate their activities. Although factors such as company sales history and economic factors are important in the setting of sales quotas, census data provide a key input to the analysis of territorial and company potentials.

Heyman discusses the application of census data to monitoring the performance of regional personnel.[7] His illustration concerns a beverage producer employing 146 area distributors. Regression analysis was used to determine the relationship between sales per capita for each distributor and various consumer variables (e.g., variables reflected in census data for the distributor's area). The study enabled the firm to set performance standards that took into consideration the demographic and socioeconomic differences between regions.

McCann also includes a relevant illustration concerning a daily metropolitan newspaper.[8] The analysis employed tract, block, and enumeration district data. Such information helped management to identify successful distributors and their practices.

A number of case studies have been published to illustrate the uses of census data in business. A rather extensive treatment of census (i.e., population and housing data and economic censuses data) and survey data applications in business is provided by May in her recent publication entitled *A Handbook for Business on The Use of Government Statistics.*[9] *Measuring Markets: A Guide to the Use of Federal and State Statistical Data*[10] includes three cases dealing with the establishement of sales quotas; the territories include cities, counties, and States, and the products include television sets, automobile batteries, and corrugated and solid fibre boxes.

SITE LOCATION

One of the most popular applications of census data in business is site location. The location analysis is applicable to a variety of facilities including retail outlets, branch offices, manufacturing plants, and distribution centers such as warehouses, In locating a new plant, the size and composition of the prospective labor force are obviously important. However with increasing transportation costs, the potential markets to be served by the facility must be considered. Retail and service outlets focus on the number and characteristics of potential customers in the relevant trade area. For example, a toy store might be interested in the number of children under 14 years, the distribution of ages for children and adults, or median family income. Although the importance of census data in site selection is difficult to overstate, it is rarely the sole input in the site location process. For example, the quality of competition and an assessment of their expansion plans, local zoning ordinances and prospects for changes, and the current and planned transportation system are all of considerable interest to the decision maker. While this section primarily discusses the utility of census data, other factors and their relevance should not be forgotten.

William Applebaum, one of the Nation's leading location analysts, traced the history of store location research. Chain tobacco stores probably began the technique's development by simply counting pedestrian traffic in front of potential outlets. The oil companies later studied automobile traffic flows as an aid in locating service stations. In the thirties, grocery store chains began to study trade areas and use economic data. Then, after World War II, developers of shopping centers felt an acute need for proper locations because of the very large investment required by such projects.[11] Today's business has access to more sophisticated methods and better data, and effective management utilizes such resources to plan expansion and enter new markets.

SIC SYSTEM

Except for portions of the censuses of transportation and agriculture, data for the economic censuses are tabulated on the basis of the Standard Industrial Classification (SIC) system, defined under the auspices of Office of Federal Statistical Policy and Standards, U.S. Department of Commerce. The SIC system is used in the classification of establishments by the type of activities in which they are engaged. It facilitates the collection, tabulation, presentation, and analysis of data relating to business, industrial, and other types of establishments. The SIC also promotes uniformity and comparability in the presentation of statistical data collected by various Federal and State agencies, trade associations, and private research organizations.

The SIC divides the Nation's economic activities into broad industrial divisions, 2-digit major groups, 3-digit industry subgroups, and 4-digit detailed industries.

In some instances, more detailed classification has been devised for census purposes so that additional industries, kinds of business, or specific products can be identified within the SIC categories. The Census Bureau has developed a system of classifying manufactured products into approximately 1,350 5-digit product classes (for example, 20371-Frozen fruits, juices, and ades) and about 13,000 7-digit products (for example, 20371 71-Frozen orange juice, concentrated) consistent with the SIC system.

The structure of the SIC classification is such that, depending on the level of industry detail called for, the Census Bureau can tabulate establishment data on an industry-code basis and, in some instances, can tabulate data for census-derived subdivisions within 4-digit industries.

More specific information on data collection procedures and methods of classifying kinds of businesses is presented in the introductory text and appendices that appear in each of the economic censuses published reports and in the *1977 Economic Censuses Procedural History* volume.

The Kroger Co. is one example of a firm actively using location analyses. They use census tract data to locate supermarkets, drugstores, and department stores. The tract data provide information both for general planning in a metropolitan area and for individual stores' trading areas. (Supermarkets usually obtain the majority of their trade from residents within one mile of the store.) Besides using income and population count data, the firm uses data on race and ethnic origins to suggest special merchandising or type of store. As mentioned previously, information on

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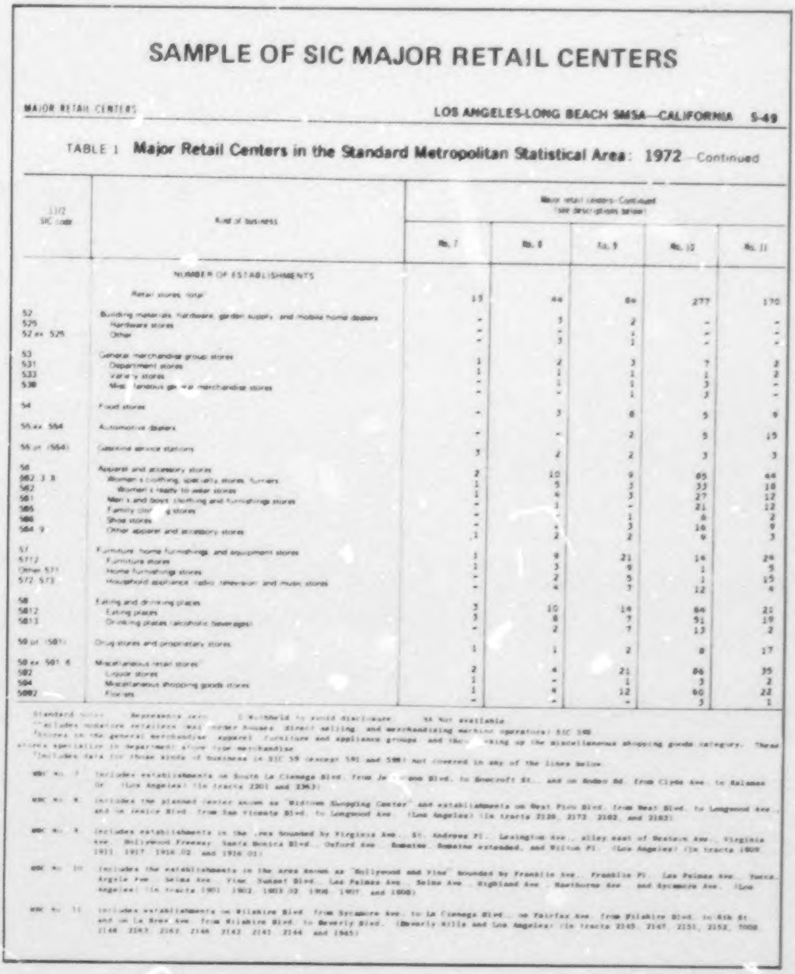

SAMPLE OF SIC MAJOR RETAIL CENTERS

MAJOR RETAIL CENTERS

LOS ANGELES-LONG BEACH SMSA—CALIFORNIA 5-49

TABLE 1 Major Retail Centers in the Standard Metropolitan Statistical Area: 1972—Continued

1972 SIC code	Kind of business	Major retail centers—Continued (see descriptions below)				
		No. 7	No. 8	No. 9	No. 10	No. 11
	NUMBER OF ESTABLISHMENTS					
	Retail stores, total	13	44	84	277	170
52	Building materials, hardware, garden supply, and mobile home dealers	-	3	2	-	-
525	Hardware stores	-	-	1	-	-
52 ex. 525	Other	-	3	1	-	-
53	General merchandise group stores	1	2	3	7	2
531	Department stores	1	1	1	1	2
533	Variety stores	-	1	1	3	-
539	Miscellaneous general merchandise stores	-	-	1	3	-
54	Food stores	-	3	8	5	9
55 ex. 554	Automotive dealers	-	-	2	5	15
55 pt. (554)	Gasoline service stations	3	2	2	3	3
56	Apparel and accessory stores	2	10	9	85	44
562, 3, 8	Women's clothing, specialty stores, furriers	1	5	3	33	18
562	Women's ready-to-wear stores	1	4	3	27	12
561	Men's and boys' clothing and furnishings stores	-	1	-	21	12
565	Family clothing stores	-	-	1	6	2
566	Shoe stores	-	2	3	16	9
564, 9	Other apparel and accessory stores	1	2	2	9	3
57	Furniture, home furnishings, and equipment stores	1	9	21	14	24
5712	Furniture stores	1	3	9	1	5
Other 571	Home furnishings stores	-	2	5	1	15
572, 573	Household appliance, radio, television, and music stores	-	4	7	12	4
58	Eating and drinking places	3	10	14	64	21
5812	Eating places	3	8	7	51	19
5813	Drinking places (alcoholic beverages)	-	2	7	13	2
59 pt. (591)	Drug stores and proprietary stores	1	1	2	8	17
59 ex. 591, 6	Miscellaneous retail stores	2	4	21	86	35
592	Liquor stores	1	-	1	3	2
594	Miscellaneous shopping goods stores	1	4	12	60	22
5992	Florists	-	-	-	3	1

competitors must also be obtained, and Kroger accomplishes this through fieldwork.[12] Nevertheless, the tract data provide accurate information on consumers within a proposed trading area without resorting to sample surveys and their attendant expense.

In the area of site selection, there are a number of useful readings. One Bureau of the Census publication, *Case Study: The Location of a Playground*,[13] does not deal with a business problem; however, it does illustrate in some detail the application of small area data to a location problem. Less detailed illustrations are found in cases that appear in both *How a Manufacturer Can Profit From Facts*[14] and *How a Retailer Can Profit From Facts*.[15] McCann's work also includes examples of location studies: A food chain, a department store, and a branch for a savings and loan association.[16] (For very detailed discussions, the reader could consult one of the volumes by Applebaum.)[11 17] While these volumes are directed to specific groups (hardware stores and supermarkets), they illustrate principles of rather broad applicability.

A SITE LOCATION EXAMPLE

The following example presents a simplified analysis of the site location problem. Nevertheless, it numerically illustrates the relevance of census data in selecting a general area (county) for expansion. As mentioned in the conclusion, the determination of the exact site would require further analyses that would include, for example, tract data and competitive considerations. This example is taken from *Measuring Markets: A Guide to the Use of Federal and State Statistical Data*.[18]

Objective

To select a county in the Syracuse, N.Y., SMSA to locate new supermarkets. The area is composed of Madison, Onondaga, and Oswego counties.

Kind of Business

A firm operating a local chain of supermarkets.

Problem

Freemans' wished to explore the possibility of expanding their operations into the Syracuse metropolitan area. The company had experienced rapid growth in their operating area and felt that the territory was saturated with supermarkets. In selecting an area within the SMSA the firm wanted to choose the county that had experienced the greatest economic growth rate and appeared to have future development characteristics.

Sources of Data

(1) *Census of Housing: 1960 and 1970—Detailed Housing Characteristics.*

(2) *Census of Population: 1960 and 1970—General Population Characteristics.*

(3) *Census of Population; 1960 and 1970—General Social and Economic Characteristics.*

(4) *Census of Business, Retail Trade—1963 and 1972.*

ASSUMPTION

Freemans' marketing department held preliminary discussions with management to determine which economic growth factors would most affect grocery store sales. Based upon its knowledge, and that of management's, the marketing department assumed that the greatest growth market indicators are population, income, housing units, car ownership, and grocery store sales. Since the *Census of Business, Retail Trade*, shows sales of establishments with and without payroll, the marketing department chose those with payroll because those without accounted for only 6.2 percent of sales in the metropolitan area.

PROCEDURE

(See calculations in Table 12-1.)

(1) Oswego county showed greater growth in population and the number of families (columns 1 and 2) in 1970 over 1960 than either Madison or Onondago Counties.

(2) When examining median family income (column 3) Oswego County grew 3.3 percent more rapidly than either of the other counties.

(3) Oswego County also had the greatest percent increase in housing units (column 4) and continued to maintain the largest share of units occupied by owners (column 5). While median rent in Oswego and Onondago Counties increased by the same percentage (column 6) it was felt that Oswego had a better growth potential due to its land development possibilities.

(4) Column 7 shows that Oswego County had the greatest decline in number of housing units without automobiles, which is also an indication of economic growth.

(5) Upon analyzing grocery store sales, Oswego also displayed the greatest growth. Based on percentage increase (column 8), it grew 10 percent more than its nearest rival, Madison County.

CONCLUSION

The market factors analyzed clearly reveal that Oswego County had the greatest growth and should continue to offer future development potential. Selection of an exact site for each supermarket within the county will be

Table 12-1. Market Factors for Evaluating Location Factors of a Food Store in Syracuse, New York, Standard Metropolitan Statistical Area

County	Population[1] (number) (1)	Families[1] (number) (2)	Family median income[2] (dollars) (3)	Occupied housing units[3] (number) (4)	Percent owner occupied[3] (5)	Median rent[3] (dollars) (6)	Housing units without automobiles (number)[3] (7)	Grocery store sales*[4] ($1,000) (8)
Madison								
1960	54,635	13,282	5,451	15,236	74.4	70	11.5	
1970	62,864	14,660	7,123	17,741	74.6	108	11.3	
Percent change	15.1	10.4	30.7	16.4	0.2	54.3	1.7	
1963								17,694
1972								28,116
Percent change								58.9
Onondaga								
1960	423,028	106,065	6,691	124,090	64.5	81	18.4	
1970	472,746	114,707	8,208	145,322	62.6	121	16.7	
Percentage change	118	8.1	22.7	17.1	2.9	49.3	9.2	
1963								137,345
1972								190,158
Percentage change								38.4
Oswego								
1960	86,118	21,063	5,580	24,323	76.0	69	17.9	
1970	100,897	24,057	7,479	29,179	76.1	103	12.6	
Percentage change	17.2	14.2	34.0	20.0	0.1	49.3	29.6	
1963								28,548
1972								48,152
Percentage change								68.7

*1972 data are not absolute they are indicative of type statistics which will appear in the 1972 Census of Business.

[1] *Census of Population, 1960 and 1970 – General Population Characteristics.* U.S. Department of Commerce.

[2] *Census of Population, 1960 and 1970 – General and Social Economic Characteristics.* U.S. Department of Commerce.

[3] *Census of Housing, 1960 and 1970 – Detailed Housing Characteristics.* U.S. Department of Commerce.

[4] Census of Business, 1963 and 1972 – Retail Trade. U.S. Department of Commerce.

COMMERCE DISTRICT OFFICES

The Department of Commerce has 43 district offices nationwide which furnish a number of services oriented primarily for business people. Commerce district offices maintain reference libraries which contain Census Bureau publications, sell Census Bureau publications in stock, and sponsor workshops with Data User Services specialists (Census Bureau employees) pertaining to the use of census data. In addition, district offices carry selected series of unpublished Census Bureau data on microfiche.

determined by an analysis of data in *1970 Census of Population and Housing Census Tract Reports* and *1972 Census of Retail Trade and Major Retail Center Reports* (both published by the Bureau of the Census), the usual onsite survey, and other sources and methods to be determined by management.

SUMMARY

In the preceeding sections, applications of census data in business were discussed. Primary emphasis was devoted to data from the census of population and housing. And, since this census will be taken every 5 years beginning in 1985, its data will be more timely and thus useful for application to current problems. Nevertheless, the business analyst should also be familiar with other data provided by the Census Bureau as well as other Federal and State agencies. For example, the economic censuses provide a wealth of information on various components of our economy. In particular, the census of retail trade and the census of manufacturers provide relevant data tabulated by the Standard Industrial Classification (SIC) system. The economic censuses are taken at 5-year intervals during years ending in "2" and "7" (e.g., 1977 and 1982). A recommended introduction to these sources is provided by *Mini-Guide to the 1977 Economic Censuses*.[19] Further, the analyst should be familiar with the annual and monthly data provided by various surveys (e.g., Annual Survey of Manufacturers, current business surveys, and Current Population Surveys).

The applications discussed herein were directed toward private businesses. However, nonprofit organizations encounter many problems similar to those described above. For example, the hospital administrator is concerned with employment guidelines; the university must forecast enrollments; and the city must effectively locate fire stations. Because of this wide applicability, census data contribute to rational, effective decisions in many areas of our society.

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Chapter 13

THE USE OF THE CENSUS OF POPULATION AND HOUSING BY GEOGRAPHERS

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Geographers will find in the decennial census of population and housing a treasure of rich resource materials. From the first decennial census of 1790 to the most recent in 1970, geographers have always found information useful in their analyses of a variety of demographic frameworks. The long continuity of the American census also makes it useful for the historical geographer for temporal comparisons. From the early censuses, which were mostly "head counts," to the more comprehensive 1980 census, the geographer, as well as other social scientists, has been and will be provided with a profile of the American people. The more recent censuses provide employment, income, and educational data that make them more attractive for geographic analysis.

For the geographer, one of the chief benefits of the census of population and housing is the way data are aggregated. Various geographic scales from national to block level are provided, which make locational (as well as temporal) comparisons possible. With the urban scene so important in today's society, the provision of data at intraurban geographic scales takes on more meaning and makes the census all the more beneficial. Geographers often use census materials as a starting point for analytical work or as a teaching tool.

There are other censuses that geographers have found useful in their work. Beginning in the late 1800's, the census of manufactures and later the censuses of retail trade, business, and wholesale trade have been of considerable use to geographers. The census of agriculture, first so designated in 1840, has always been a primary research tool for the agricultural geographer. These censuses along with the census of population and housing provide data aggregation at scales popular with geographers.

It is impossible to recount the many uses that geographers have made of these censuses in a chapter. Only a few will be mentioned to highlight the possibilities.

Historical

A good example of how geographers have used earlier censuses of population is exemplified in James D. Vance's "Cities in the Shaping of the American Nation." Vance argues convincingly that early settlement in the country had an *urban* focus, not rural.[1] By tracing the population of cities from 1790 (the date of the first decennial census) to the present, Vance points out the coastal importance of early cities as transshipping points for nonagricultural products (e.g., furs, timbers, and metals). The marketing superstructure provided by the import—export entrepreneurs and the accumulated capital led to the eventual growth of these cities as manufacturing centers. Philadelphia, Pa., Boston, Mass., Charleston, S.C., Baltimore, Md., and Salem, Mass., are included in this list.

By 1830 cities had a somewhat different locational focus. Now they were found along inland waterways that provided access to ocean ports. Thus, "river towns" began to spring to life and became part of the American urban fabric. As inland cities, they functioned as collection points for interior agricultural regions and provided the needed function of transportation to coastal ports, then to international markets. As early as the 1800's a kind of geographical urban balance was achieved. Even in the agriculturally specialized American Midwest, we had such cities as Indianapolis, Ind., Milwaukee, Wisc., and St. Louis, Mo. Certainly by 1910 there was a clear pattern: the emergence of the regional trading center. Only the South lagged behind. As changing economies took hold in the South in recent decades, it too experienced a growth in urbanization.

Vance's use of the census of population is instructive. He used the decennial censuses to build his arguments and illustrate his narrative. In this case, the census provided the author with the temporal sequence so important to the development of his ideas. It is a classic application of the use of historic census materials.

There are other examples of how geographers have used historical census materials. One, *The Spatial Dynamics of U.S. Urban-Industrial Growth, 1800-1914*, should be mentioned.[2] Not only does the author use the decennial censuses but also cites the historical compendium published by the Bureau of the Census, notably the *Historical Statistics of the United States, Colonial Times to 1957.*[3] This volume has now been updated to 1970.

Retail Geography

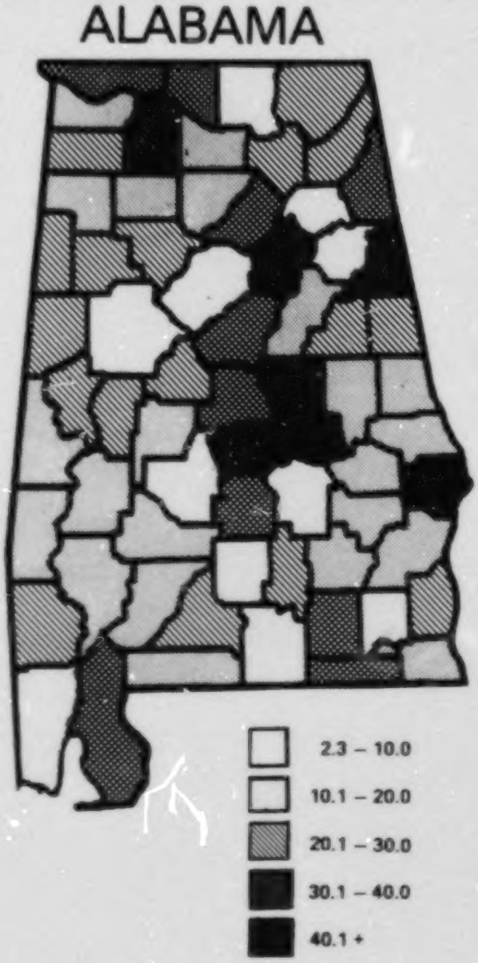
In the area of applied geography, geographers have dealt extensively with census data in retail and marketing studies. Census variables (e.g., total population, population density, income, educational levels, housing counts) are indispensable for the retail site analyst. Several important publications relate the importance of census data for these studies. Among these are the Urban Land Institute's *Shopping Center Development Handbook,*[4] and William Applebaum's *Guide to Store Location Research,*[5] and *Measuring Markets: A Guide to the Use of Federal and State Statistical Data*, published by the U.S. Department of Commerce.[6]

The marketing geographer will generally use census data at two scales of analysis. At the broad or macro scale regional patterns of change are examined by using State and county level census reports. Updated adjustments to most recent censuses are made by using the *Current Population Reports*. In urban areas, the analyst will most likely use census tract or block data for much of the needed demographic variables and use the economic censuses to augment the task. Using data collected from these sources, the marketing geographer will generally map the information for the study area in order to begin the site-selection task. Dent[7,8] and Young,[9] among others, have used these approaches in their studies to analyze shopping center trade areas and to look at historical changes in the Central Business District (CBD).

Geographic Atlases

In recent years many geographers and cartographers have relied heavily on census of population and housing documents for the production of State atlases. Included among the general atlas variety are *The Atlas of Alabama,*[10] *Metrolina Atlas,*[11] *North Carolina Atlas: Portrait of a Changing Southern State,*[12] and the *Atlas of Oregon.*[13] Two atlases that contain only computer generated maps using census data from tapes are *Stillwater, Oklahoma: A Computer Generated Atlas,*[14] and *The Map Abstract of Population and Housing: Alabama, 1970.*[15] Two other atlases that contain only computer maps but used the paper-ink census of population and housing formats for data are the *Atlas of Atlanta*[16] and the *Atlas of Metro-Atlanta, the 1970's.*[17] Another atlas, *The Changing Population of The Southeast*[18] used the 1960 and 1970 Censuses of Population and Housing as the primary data sources in conjunction with the *1968 Annual Report of Vital Statistics*. Geographers have found census materials to be excellent sources of data for the production of these State and regional atlases. In turn, these atlases provide good reference material for students and others interested in the geographic distribution of our human resources (fig. 13-1).

An atlas project of much more ambitious dimensions is that produced as part of the Comparative Metropolitan Analysis Project, sponsored by the



Source: Adapted from Plate 32, Percentage of Employed Persons Working Outside County of Residence in J.W. Florin and R.J. Kopec's *The Changing Population of the Southeast.*

Figure 13-1. Percentage of Employed Persons Working Outside County of Residence.

Association of American Geographers and funded by the National Science Foundation.[19] This atlas of 20 metropolitan areas used the 1970 Census of Population and Housing as its primary research base. Data by tracts were employed throughout. What makes this atlas possible, of course, is that *mappable* geographical scales are provided in Census Bureau products. Moreover, these data are provided in a comparable format for the 20 cities.

Quality Of Life Indicators

Geographers have for years developed "quality of life" indicators for mapping composite scores to better understand the sociohuman scale within urban areas. Typical variables that go to make up the quality of life scores include infant mortality, crime (homicides, burglaries and other crimes), housing quality, income, education levels, and population density. In his study of Atlanta's black community, Bederman employed tract-level data from the 1970 Census of Population and Housing in his quality of life index.[20] He later conducted a macro scale study of quality of life for the entire State of Georgia.[21] In this latter study, county level data were also obtained from the 1970 Census of Population and Housing.

A DETAILED EXAMPLE

In Smith's book *The Geography of Social Well-Being*,[22] he presents a detailed account of the methodology of quality of life studies in the city of Tampa, Fla. This study is summarized here to illustrate how census data can be used for one type of geographical analysis.

Purpose of the Study

The purpose of the Tampa study was to identify target areas for programs that were to be administered to raise the quality of life of deprived urban residents.

Background. Poverty area tracts in the city of Tampa were identified in 1967. The following criteria were used to develop composite poverty indices:

Percent of families with cash incomes under $3,000;

Percent of children under 18 years old not living with both parents;

Percent of males 25 years old and over with less than 8 years of school completed;

Percent of unskilled males (laborers and service workers) 14 years old and over in the employed civilian labor force; and

Percent of all housing units lacking some or all plumbing facilities or dilapidated.

At the same time, Tampa joined the Model Cities Program, which was developed by the Demonstration Cities and Metropolitan Development Act of 1966. Under this program, a model neighborhood area (MNA) was identified. This area was to receive programs to improve the quality of urban living. Four years later Tampa elected to join the Planned Variation Program, an extension of the Model Cities idea, to aid in the provision of revenue sharing. Planned Variation "target areas" were determined by using the following variables: Housing conditions, physical conditions, health, crime and delinquency, unemployment, and welfare services. The poverty areas, model cities neighborhoods, and the planned variation target areas were mapped (fig. 13-2).

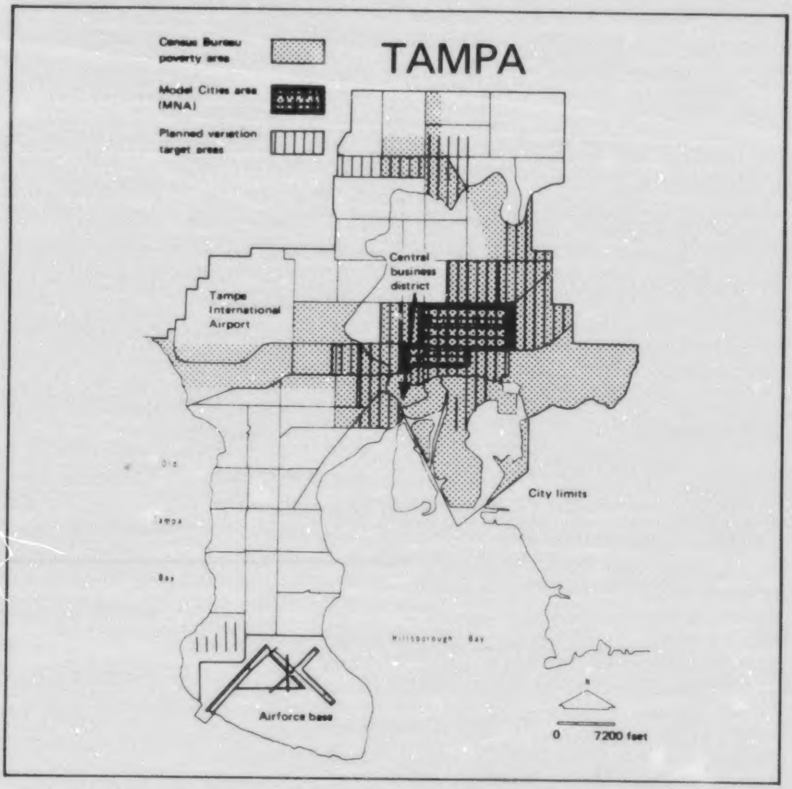

Census Bureau poverty area
Model Cities area (MNA)
Planned variation target areas
TAMPA
Central business district
Tampa International Airport
Old Tampa Bay
City limits
Hillsborough Bay
Airforce base
N
0 7200 feet

Figure 13-2. **Three Alternative Definitions of "Problem Areas" in Tampa, Florida. The Subdivisions Are Census Tracts. (Source: After Smith, 1973.)**

Quality of Life Variables

Smith extended the studies conducted by the Government agencies and undertook a much more exhaustive quality of life analysis. He and his associates adopted 6 major criteria and 47 variables to develop the composite quality of life indices (table 13-1). A large amount of data was obtained from the 1970 Census of Population and Housing, and additional data were collected from local governmental sources. The choice of data variables is always a concern to the researcher and usually a compromise between the ideal and the constraints of time and resources. Smith concludes, however, "...the data assembled provide a satisfactory reflection of the general concept of social well-being and embody many important conditions which have a bearing on the quality of individual life."

Table 13-1. Criteria of Social Well-Being and Variables Used in Tampa Study

Criteria and Variables	Directional Component
I ECONOMIC STATUS	
i) *Income*	
1 Income per capita ($) of persons 14 and over 1970	+
2 Families with income less than $3000 (%) 1970	–
3 Families with income over $10,000 (%) 1970	+
4 Persons in families below poverty level (%) 1970	–
ii) *Employment*	
5 Unemployed persons (% total workforce) 1970	–
6 Persons aged 16 to 24 working less than 40 weeks (%) 1969	–
7 White-collar workers (%) 1970	+
8 Blue-collar workers (%) 1970	–
iii) *Welfare*	
9 Families on AFDC program (%) October 1971	–
10 Persons aged 65 and over on Old Age Assistance (%) Oct. 1971	–
II ENVIRONMENT	
i) *Housing*	
11 Average value of owner-occupied units ($) 1970	+
12 Owner-occupied units valued less than $10,000 (%) 1970	–
13 Average monthly rental of rented units ($) 1970	+
14 Rented units with monthly rentals less than $60 (%) 1970	–
15 Units with complete plumbing facilities (%) 1970	+
16 Deteriorating and dilapidated houses (%) 1971	–
ii) *Streets and Sewers*	
17 Streets needing reconstruction (% of total length) 1971	–
18 Streets needing scarification and resurfacing (% of total length) 1971	–
19 Sanitary sewer deficiencies (% of total area) 1971	–
20 Storm sewer deficiencies (% of total area) 1971	–
iii) *Air Pollution*	
21 Maximum monthly dustfall (tons/sq. mile) 1969	–
22 Average suspended particulates 1969 (μgm/m^3/day) 1969	–
23 Maximum monthly sulfation 1969 (mg SO$_3$/100cm^2/day) 1969	–

Table 13-1. Criteria of Social Well-Being and Variables Used in Tampa Study (Cont'd)

Criteria and Variables	Directional Component
vi) *Open space*	
24 Area lacking park and recreation facilities (%) 1971	–
III HEALTH	
i) *General Mortality*	
25 Infant deaths (per 1000 live births) 1970	–
26 Death rate (per 10,000 persons 65 or over) 1970	–
ii) *Chronic Diseases*	
27 Cancer deaths (per 100,000 population) 1970	–
28 Stroke deaths (per 100,000 population) 1970	–
29 Heart disease deaths (per 100,000 population) 1970	–
30 New active tuberculosis cases (per 100,000 population) 1970	–
IV EDUCATION	
i) *Duration*	
31 Persons aged 18 to 24 with 4 or more years high school or college (%) 1970	+
32 Persons over 25 with 8 years or less school (%) 1970	–
33 Persons over 25 with 4 years high school (%) 1970	+
34 Persons over 25 with 4 years college (%) 1970	+
V SOCIAL DISORGANIZATION	
i) *Personal Pathologies*	
35 Narcotic violations arrests (per 10,000 residents) 1971	–
36 Venereal disease cases (per 10,000 population) 1970	–
ii) *Family Breakdown*	
37 Families with children, having husband and wife present (%) 1970	+
38 Persons separated or divorced (% ever married) 1970	–
iii) *Overcrowding*	
39 Dwellings with more than 1.0 persons per room (%) 1970	–
iv) *Public Order and Safety*	
40 Criminal violation arrests (per 1000 residents) 1971	–
41 Juvenile delinquency arrests (per 10,000 residents) 1971	–
42 Accidental deaths (per 100,000 population) 1970	–
v) *Delinquency*	
43 Juvenile delinquency arrests by residency (per 10,000 population) 1971	–
VI PARTICIPATION AND EQUALITY	
i) *Electoral Participation*	
44 Registered voters (% population 18 and over) 1971	+
45 Eligible voters voting in mayoral election (%) 1971	+
ii) *Equality*	
46 Racial distribution index 1970	–
47 Income distribution index 1970	–

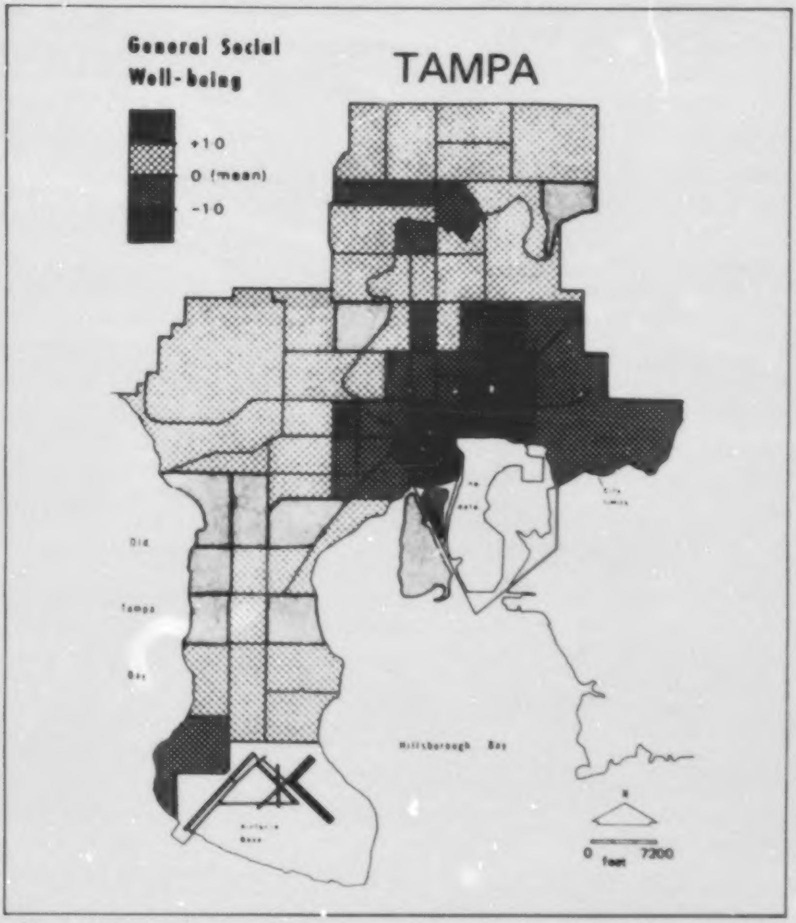

General Social Well-being
+1.0
0 (mean)
-1.0
TAMPA
Old Tampa Bay
Hillsborough Bay
N
0 feet 7200

Figure 13-3. Standard Scores on a General Indicator of Social Well-being, Based on Data on all 47 Variables Listed in Table 9-1. (Source: After Smith, 1973.)

Methodology

The first attempt at aggregating the 47 variables was to use the "Standard Score Additive Model," a method where original data are literally transformed into Z-scores, then added to derive composite scores. By adding all classes together, one can obtain a general indicator. These can be mapped by tract, as shown here. Each variable has a directional component of (+) or (-) depending on the Z-scores' values above or below the mean (table 13-1 and figure 13-3).

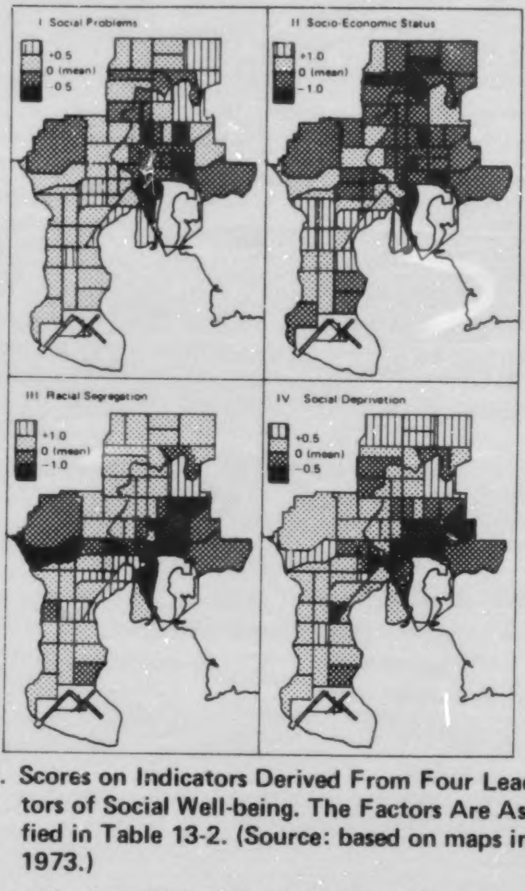

I Social Problems
+0.5
0 (mean)
-0.5
II Socio-Economic Status
+1.0
0 (mean)
-1.0
III Racial Segregation
+1.0
0 (mean)
-1.0
IV Social Deprivation
+0.5
0 (mean)
-0.5

Figure 13-4. **Scores on Indicators Derived From Four Leading Factors of Social Well-being. The Factors Are As Identified in Table 13-2. (Source: based on maps in Smith, 1973.)**

One difficulty with the additive model is that it does not reveal the quantitative interrelationships among variables. As a result, Smith subjected the data variables to a factor analysis test. Specifically, in this method all data and their interrelationships are determined by computing intercorrelations among all data variables, such that primary "factors" (groups of variables that are highly associated with each other) are revealed. A term called "loading" is generated, which is the correlation coefficient between variables and the factors. For this study, social problems, socioeconomic status, racial segregation, and social deprivation were factors one through four, respectively. The loadings of each variable on these factors are reproduced in table 13-2. Again, these may be mapped by tract (see fig. 13-4). Each factor is mapped separately and, using this method, the *geographical distribution* of these quality-of-life indices becomes apparent.

Table 13-2. Highest Loadings on Leading Social Well-being Factors in Tampa

Criteria and Variable	Highest loadings
1. SOCIAL PROBLEMS (explained variance: 17.8%)	
Death rate	.998
Heart disease deaths	.946
Cancer deaths	.905
Criminal violation arrests	.885
Juvenile delinquency arrests	.851
Stroke deaths	.789
Families on AFDC	.682
Persons separated or divorced	.619
Juvenile delinquency arrests by residence	.605
Families with children having husband and wife	.567
Narcotics violations	.554
Families with incomes less than $3000	.552
Venereal disease	.520
Persons 18 to 24 with 4 years high school or college	.501
2. SOCIOECONOMIC STATUS (explained variance: 11.3%)	
Persons over 25 with 4 years college	.934
Average value of owner-occupied housing units	.909
Income per capita	.744
Blue-collar workers	.633
Families with incomes over $10,000	.615
Maximum monthly sulfation	−.568
Average monthly rental of rented housing units	.556
White-collar workers	.548
Persons over 25 with 8 years school	.533
Owner-occupied housing units valued less than $10,000	.498
Registered voters	.454
3. RACIAL SEGREGATION (explained variance: 9.5%)	
Racial distribution index	.878
Dwelling with more than 1.0 persons per room	.846
Persons on Old Age Assistance	.710
Persons over 25 with 4 years high school	.479
Persons 18 to 24 with 4 years high school or college	.465
Juvenile delinquency arrests by residence	.462
White-collar workers	.434
Families on AFDC	.421
4. SOCIAL DEPRIVATION (explained variance: 8.3%)	
Unemployed persons	.834
New active tuberculosis cases	.810
Housing units with complete plumbing	.640
Narcotics violations	.590
Venereal disease	.513
Families having husband and wife with children	.450
Persons in families below poverty level	.441
Infant deaths	.434

Conclusions

Smith concludes that intracity quality-of-life indicators can (1) provide information for decisionmakers who formulate public urban planning policy, (2) identify problem areas, and (3) provide a structure to seemingly random collections of data. It was discovered in his analysis that the physical environment appeared to play little importance with social problems, suggesting that "face-life" projects (physical redesign) may solve few problems and do not get to the cause of social ills. Smith concludes:

> When the largely demographic and economic data from the census are augmented or replaced by information on the broad range of conditions contributing to social well-being, the spatial structure of cities appears to take on a somewhat different form. The limited evidence available suggests that the population of subareas of the city may be primarily differentiated according to the incidence of social problems rather than according to their socioeconomic status, stage in life cycle, or ethnic background. If further studies of the kind reported here confirmed this, then the geographer's view of the city must change. He will begin to see patterns of social problems, or areal differentiation with respect to social well-being, transcending the economic and demographic patterns which have dominated his previous observations. He will thus achieve a more humanistic view of the internal differentiation of cities. He may then be led to examine the basic mechanism within the quality of life as exist in the American city, and to begin to design some alternatives to create a new spatial order.

SUMMARY

Only a few of the kinds of uses geographers have made of the census of population and housing have been mentioned here. To be sure, the list is varied and long.[23] However, the ones selected indicate the diverse possibilities not only in topic but also in scale. Geographers will no doubt continue to find the census helpful, and they will continue to explore other ways in which they can derive data from these most resourceful volumes.

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Chapter 14

THE USE OF CENSUS DATA BY SOCIAL DEMOGRAPHERS

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RESEARCH ISSUES

The decennial censuses of population and housing offer a rich supply of materials for use in the conduct of research. In this chapter we first provide an overview of some of the research issues that sociologists and social demographers investigate with census resources. We then turn to a specific application of census data as they might be used by a sociologist or a social demographer.

The decennial censuses provide the researcher with almost complete information on the United States population and its various geographic subpopulations (i.e., regions, States, metropolitan areas, cities, counties, etc.). The censuses give detailed information on the size of the population and subpopulations, their composition (i.e., their age, sex, and racial structure or their economic, educational, and labor force structure), and their spatial distributions (i.e., regional, metropolitan/nonmetropolitan, and rural–urban). Moreover, in recent years the censuses have contained information on residential mobility, fertility, and, of course, housing. The decennial censuses, therefore, are the major source of statistical data for sociologists and social demographers.

The fact that census data are available for a variety of geographic units is significant in itself. The focus of research can be as broad as the entire Nation with its several regions or as narrow as an individual metropolitan area or county. It even permits the researcher to break cities down into their constituent census tracts or blocks for a closer view. Thus, there have been studies of the increase in the size of the entire American population [1] and of migration streams among the various regions and States within the Nation [2] and the Nation's metropolitan areas.[3] There have also been a series of studies of cities as collections of census tracts and blocks (this refers to the literature on social area analysis and factorial ecology).[4] Another set of topics of interest to sociologists and social demographers alike is that of social stratification, inequality, and social mobility. While sociologists and others researching in these areas can focus on any given unit of analysis, as was noted above, they frequently combine data on size and composition. Thus, they may ask questions regarding the extent to which males and females in the United States are located in similar or dissimilar occupational structures or experience differential education attainment and the degree to which these patterns have changed over time.[5] [7] By adding the distribution dimension to those of size and composition, researchers also asked about the degree to which various groups (e.g., race, ethnic, age, occupation) are residentially segregated from one another in the cities of the United States, whether or not this has increased or decreased over the years and what kinds of factors may be influencing the segregation levels.[8] [12] Retaining the compositional characteristics of race and ethnicity while focusing on economic status, other sociologists and social demographers have turned their attention to the degree to which white males earn more money than blacks, Mexican-Americans, and females, and the extent to which this phenomenon has changed over time.[13] [15] One topic that has been of major importance to the sociological literature is the family. Consequently, there is a great deal of research that focuses on the structure of the family,[16] the impact of changes in the family life cycle[17] and the changing roles of women in society.[18] More recently, attention is being paid to the incidence of alternative living arrangements and the possible consequences these may have with a family as an institution and for the society as a whole.[19]

Along a similar vein, the situation of the elderly is of growing interest as they become an increasing proportion of the total population of the United States. Greater significance is being attached to information on migration patterns of the elderly, [20] [21] the number of elderly living in various kinds of institutional settings as well as in other types of arrangements, [22] and their social and economic circumstances. [23]

The preceding are but selected examples of the kinds of studies sociologists and social demographers have carried out with data from the previous decennial censuses. Similar studies will undoubtedly be carried out with data derived from the 1980 Census of Population and Housing. In each instance, the census materials allow the researcher to address matters of crucial relevance and importance for the society at large as well as for their own individual scholarly specializations. With this in mind we turn now to the detailed discussion of a specific application of census data: Is there an "ethnic" cost to being a Mexican-American?

EARNINGS DIFFERENCES BETWEEN ANGLO AND MEXICAN-AMERICAN WORKERS

Numerous studies exist in the sociological literature that report an Anglo advantage in earnings over comparably defined Mexican-Americans[24,26] Part of this advantage may well be a result of differences in education; that is, Mexican-Americans with lower levels of educational attainment than Anglos earn fewer dollars than Anglos. It is also possible that part of this advantage is a result of differences in occupation; that is, Mexican Americans are generally in less prestigious occupations, and hence report lower earnings than Anglos. Still a third possible reason for the Anglo earnings advantage is the fact that more Mexican-Americans than Anglos are engaged in part-time work; the fewer hours and weeks one works, the less money the person receives for the work. Mexican-Americans are also found with greater relative frequency in rural areas than Anglos, and since wage scales generally are lower in rural areas, this differential may be another reason why Anglos earn more than Mexican-Americans.

The events of the 1960's would appear to suggest that the "cost" of being a Mexican-American worker should have declined since 1960. The past few years have witnessed the emergence of what Alvarez has called the "Chicano Generation," a phenomenon involving not only a "new consciousness beginning to make itself felt among Mexican-Americans" but also a Mexican-American movement with its attendant demands for equal resources and opportunities.[27] This new awareness has been further reinforced by the civil rights legislation of the 1960's, and judicial decisions intended to provide equal resources and opportunities for all citizens. While it is true that these events have followed by a number of years the parallel activities of the black population, most would claim, especially in the Southwest, that the Chicano movement has had an impact on the ways and thinking of the Anglo majority.

Less clear, however, are the effects of the Chicano movement and civil rights legislation on older Mexican-Americans, particularly those who were already functioning in the work force when the movement began. If the experiences of the black population are mirrored in the Mexican-American population, we should not expect much improvement in the conditions of these older workers. For example, Farley and Hermalin observed that improvement in socioeconomic status increased more rapidly for blacks than for whites during the 1960's.[28] Their abbreviated cohort analysis, however, suggested the conclusion that " . . . apparently, even during the prosperous 1960's, there was not much relative improvement in income for black men who were 25 and over in 1960."[29] If the Mexican-American experience does parallel that of blacks, it might be hypothesized that the "cost" of being an older Mexican-American in 1970 has remained the same, or perhaps even increased, since 1960.

Data and Methods

Data

The data for this study are taken from the Public Use Samples of the 1960 and 1970 Census of Population.[30] [31] The 1960 sample is a 1-percent sample of the basic records and the 1970 sample is nearly twice as large because of the development by the Census Bureau of multiple Public Use Samples for 1970. After imposing a number of constraints upon the samples (see below), the 1960 sample numbered 20,359 Anglos and 2,201 Mexican Americans. The 1970 sample was more than twice as large and included 45,281 Anglos and 5,294 Mexican Americans.

The 1960 and 1970 Public Use Samples

The public use samples are multireel files of population and household data based on 1-percent samples of the individual records from the 1960 and 1970 census enumerations. As noted earlier in this volume, the smallest territorial identification unit in the 1960 file is the State; and there are a total of 30 reels available (some with more than one State). The 1970 files are more extensive, however.

Recall that the 1970 census enumeration used two schedules, 1 of every 5 households was administered a lengthy questionnaire, and 1 of every 20 households was administered a longer and slightly different questionnaire; these two samples became known as the 15-percent and the 5-percent samples, respectively. In assembling PUS files for 1970 the Bureau prepared separate files for both the 15-percent basic sample and the 5-percent basic sample. Further, there were three geographic base files developed in 1970: (1) A State file; (2) a SMSA file (over 250,000 in population); and (3) a neighborhood characteristic file. Therefore, there was a total of *six* PUS files produced for 1970: the State and neighborhood files (for both the 15-percent and 5-percent samples consisting of 33 tapes each), and the SMSA file (again for both the 15-percent and 5-percent samples consisting of 30 tapes).

These six PUS files for 1970 are separate files of households and individuals. That is, different persons make up the samples in each of the six files. Thus if you used both the 15-percent and 5-percent tapes for the States, and one of your data needs was earnings by color, age, and occupation, you would have in actuality a 2-percent sample by combining the 15-percent and 5-percent files together. (For analyses where geographical identification was not needed in detail, one could combine all six files and have a 6-percent file of basic records from the 1970 census, or data on about 12 million individuals.) In the present study we use the 5-percent and 15-percent 1970 State samples for the five Southwestern States.

Spanish Surname Data

Analysis of the Mexican American population based on data from decennial censuses is handicapped to a certain degree by the quality of the Mexican American data. In the 1960 census, Mexican Americans were not enumerated as such, but were identified by coders on an ex post facto basis as "white persons of Spanish surname"; this designation was based on a list of about 7,000 Spanish surnames compiled by the Immigration and Naturalization Service. There are indeed problems with this approach in the identification of the Mexican American population, although it has been considered by some as preferable to the earlier census practice of "having the enumerators identify persons in terms of race or use of the mother tongue."[32]

In 1970 more extensive approaches were employed in the identification of the Spanish heritage population. Although still not without validity and reliability problems, these new procedures probably resulted in the best data on Spanish ethnic groups heretofore possible. However, since our strategy involves the comparison of earnings data for Anglos and Mexican Americans for 1960 and 1970, the Spanish surname data set was used to identify the Mexican American population in 1970, principally for comparability purposes.

Sample Constraints

In developing the samples of Anglo and Mexican American males, we imposed a series of controls so that the resulting subpopulations would be closely comparable on relevant socioeconomic and demographic characteristics. Included in our samples of the two ethnic groups therefore are only those males who were full-time workers, between the ages of 30 and 50 in 1970, in predominantly urban occupations, and residing in one of the five Southwestern States of Arizona, California, Colorado, New Mexico, or Texas.

As we noted at the beginning of this paper, an investigation of earnings differences between two groups may be significantly influenced by the distribution of full- and part-time workers in each of the groups. If the amount of time spent in the workforce were not taken into consideration, one could argue that resulting earnings differences may be due to the heavier representation of part-time workers in one group than in the other. We have thus included in our 1960 and 1970 samples only those Anglo and Mexican American males who both (1) worked at least 40 weeks during the year preceding the census (i.e., 1959 or 1969), and (2) worked at least 35 hours in the week preceding April 1, 1960 (or 1970), the date of the census enumeration. It is assumed that those men working a full-time week during the week preceding the census enumeration were also working a full week in the 40 or more weeks they worked in 1959 (or 1969). There are methodological problems with this strategy, but it is the closest one can approximate the full-time variable with data from the decennial censuses.

Another constraint imposed upon our samples is the employment of predominantly urban occupations. We exclude farmers and farm managers, and farm laborers and foremen, because of the well-documented findings on the economic retardation of Mexican-Americans in farm occupations, where the great economic disparities exist. [33] This constraint is an important one to remember in the presentation and interpretation of the findings. Clearly, the analyses do not apply to all Mexican-American (or Anglo) male workers.

A third sample constraint is age. Included are males not older than 40 years in 1960 (and 50 years in 1970). Specifying an upper-age boundary on the sample permits the inclusion of a larger portion of native-born Mexican Americans than would have been possible had we included Mexican Americans, say, up to age 64. By further restricting the sample to men who were not beyond age 40 in 1960, we keep to a minimum the number of Mexican-Americans who began employment prior to World War II. This is another important consideration because of the fact that World War II was a turning point for Mexican-Americans in terms of a reduction in discrimination and an increase in educational and economic opportunities.[34] [35] Had we included the older Mexican-Americans in the sample with their heavily foreign-born backgrounds, limited formal education, and largely unskilled occupational positions, earnings differences between the full component of Mexican-Americans and Anglos may have been inflated substantially. As with the other sample constraints, our purpose in imposing them on the samples of Anglo and Mexican-American men is to make the two ethnic groups as comparable as possible on those demographic and labor-force characteristics that influence earnings.

A final constraint refers to region of residence. Only those workers residing in one of the five Southwestern States of Arizona, California, Colorado, New Mexico, or Texas are included. This constraint was necessary, since Spanish surname data for 1960 and 1970 are only reported for this region. The problem is not serious for the Mexican-American population, since the greatest numbers of them reside in the Southwest. With respect to the Anglo population, we could have drawn a sample from the entire United States, but decided against this procedure because of regional differences in wages, dollar value, and labor force demand.

We have specified four criteria in the definition of the samples of Anglo and Mexican American workers to be analyzed in this study: We include men who were full-time workers, in predominantly urban occupations, between the ages of 20 and 40 in 1960 (and 30 and 50 in 1970), and residing in one of the five Southwestern States. Were these characteristics not taken into consideration, net earnings figures between the two ethnic groups might be confounded. Since the Anglo and Mexican American males in the sample are a somewhat select group, however, and probably not representative of the larger populations from which they were drawn, our findings will be applicable only to the sample populations investigated.

Findings*

In figures 1 through 8, the relationships between educational attainment and average earnings for each occupational category in 1959 and 1969 have been plotted. Income for both time periods has been expressed in 1959 dollars for purposes of comparability. The Mexican-American plots are represented by dashed lines, and solid lines indicate the plots for Anglos.

The general pattern emerging after examining the eight figures is that in both 1959 and 1969, with only one exception in each year, Anglo workers have higher average earnings in every occupational group and at every level of educational attainment than Mexican Americans. Both groups reported higher earnings in 1969 than in 1959, and in all except three instances Mexican-American earnings in 1969 were above those for Anglos in 1959. In spite of increases for Mexican-Americans, however, it appears that earnings rose more rapidly for Anglo workers, and that the overall "cost" of being a Mexican-American worker may have become greater in 1969 than it was in 1959. **

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*In constructing the eight scatter diagrams the educational data were grouped:

0–7 years of school completed	6
8 years of school completed	8
1–3 years of high school completed	10
4 years of high school completed	12
1–3 years of college completed	14
4 or more years of college completed	16

See references 13 and 26 for a more detailed statement. Further, entries are not shown on the scatter diagrams if they represent averages based on less than 10 sample cases. Since a 1/100 sample was employed, an income average was not reported for an occupation by education group if the total number of workers in the group was less than 1,000.

**Earnings for both 1959 and 1969 were measured with earnings data, namely, wages, salary, commissions, bonuses, or tips from all jobs. See references 31 and 32.

Among professional workers (fig. 14-1), earnings differences between Mexican-American and Anglo workers increased at all educational levels between 1959 and 1969, with the largest increase ($1,400) occurring among workers with a high school diploma. That is, in 1959 Anglo professionals earned about $600 more than Mexican American professionals; in 1969 this difference had increased by over $1,400 so that it exceeded $2,000. The smallest difference between Mexican-Americans and Anglos in 1969 was $1,500, or approximately two-and-a-half times as large as the smallest difference in 1959.

In both 1959 and 1969 the income differences between Anglo and Mexican-American managers, officials, and proprietors (fig. 14-2) were larger at most levels of educational attainment than in any other occupational category. Furthermore, at four of the six levels of educational attainment, the differences between the two ethnic groups increased between 1959 and 1969. For example, in 1959 Anglo managers with 4 or more years of college earned on the average $2,300 more than Mexican-American managers with the same education; by 1969 this differential had increased to $3,500.

Among clerical workers (fig. 14-3), with one exception, earnings differences between Mexican-Americans and Anglos rose between 1959 and 1969. The largest difference in 1969 ($2,600) was found among workers with 4 or more years of college, a category for which no comparable data were available in 1959. The pattern for sales workers (fig. 14-4) was more mixed or varied than that for clerical workers, including the one instance in 1969 where Mexican- American workers earned more than Anglos in the same occupation and at the same educational level (4 years of college or more). Yet at the other extreme (0 to 7 years of schooling) Anglo sales workers in 1969 reported earnings on the average of $3,700 more than Mexican American sales workers with the same level of education, the largest income difference between Anglos and Mexican-Americans in either 1969 or 1959.

Income differences between Anglo and Mexican-American blue-collar or manual workers in both 1959 and 1969 were less pronounced than the corresponding differences in the white-collar or nonmanual occupational categories. At most levels of educational attainment for Anglo and Mexican American craftsmen (fig.14-5), the differences reported for 1959 increased slightly by 1969. The largest increase among craftsmen, however, was only $750 (for those with an eighth grade education), an amount considerably less than some of the increases noted earlier for the white-collar occupations. While no comparison was made between 1959 and 1969 for craftsmen with college degrees, we note that the difference between Anglo and Mexican-American craftsmen in 1969 at this level of educational attainment was $2,900, and this is the only case in 1969 where income differences between Anglo and Mexican-American blue-collar workers exceeded $1,700.

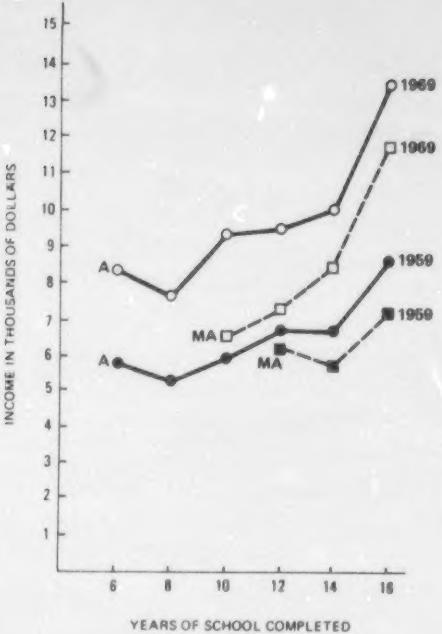

Figure 14-1. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Professional, Technical, and Kindred Workers.

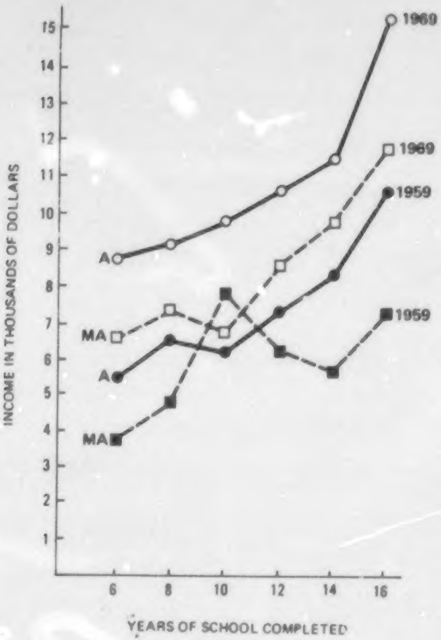

Figure 14-2. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Managers, Officials, and Proprietors.

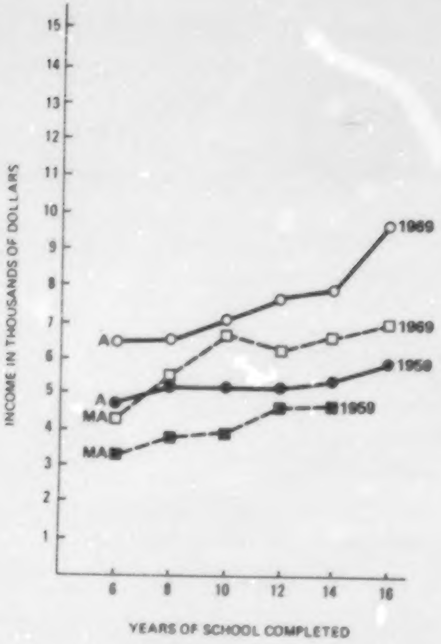

Figure 14-3. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Clerical and Kindred Workers.

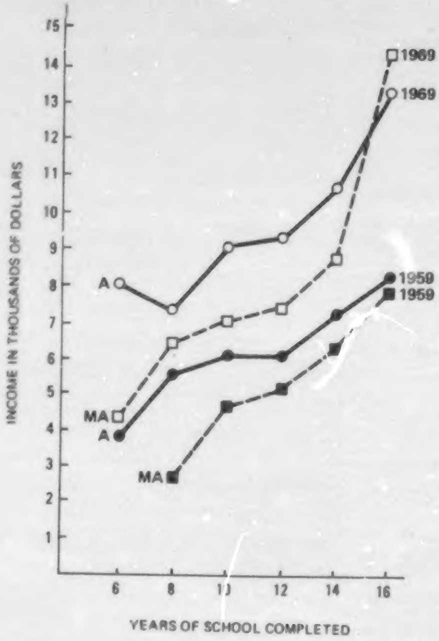

Figure 14-4. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Sales Workers.

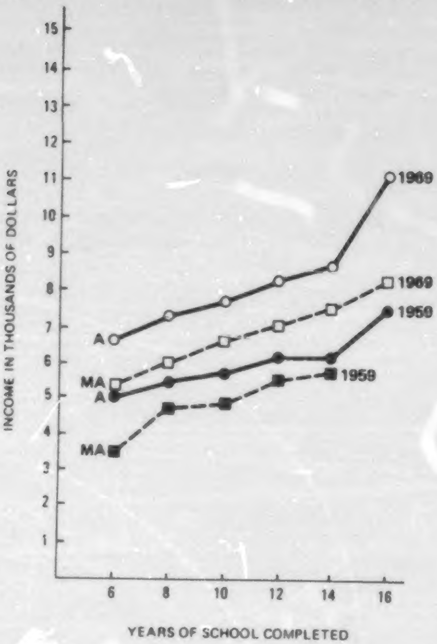

Figure 14-5. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Craftsmen, Foremen, and Kindred Workers.

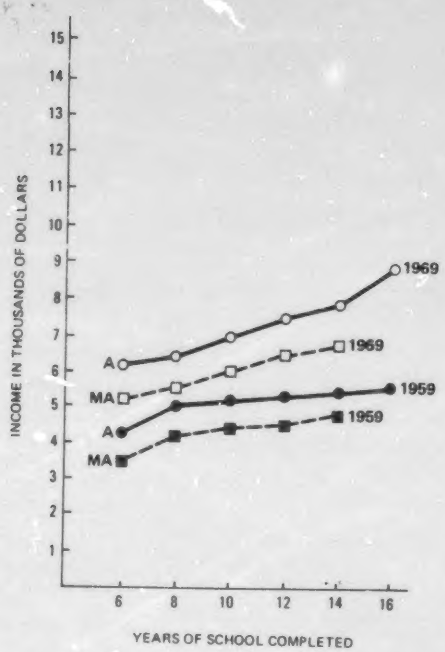

Figure 14-6. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Operatives and Kindred Workers.

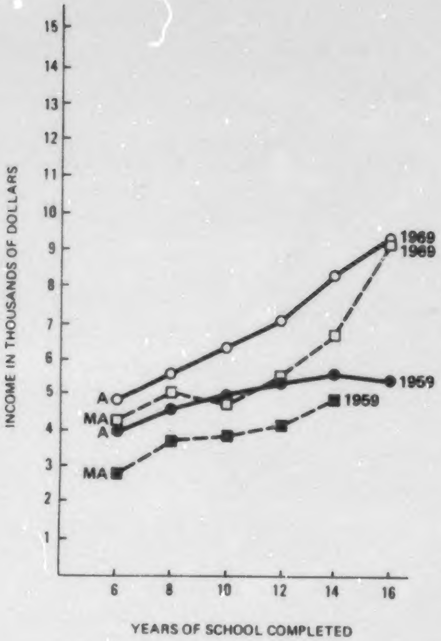

Figure 14-7. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Service Workers, Except Private Household.

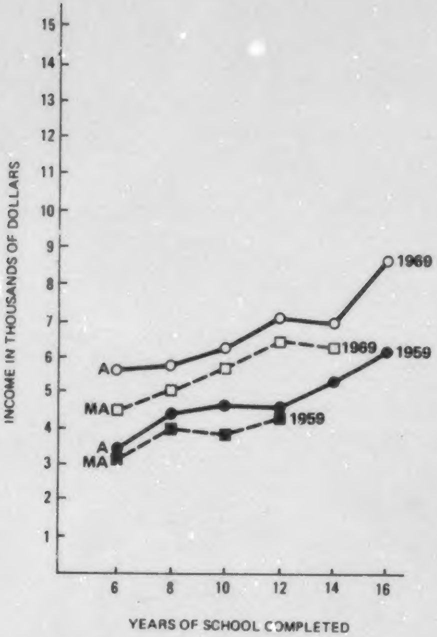

Figure 14-8. Mean Income of Male Anglo and Mexican-American Workers at Various Levels of Educational Attainment, 20-40 Years Old in 1959 and 30-50 Years Old in 1969: Laborers.

Differences widened slightly between 1959 and 1969 in average earnings between Anglo and Mexican American operatives (fig.14-6) at the five levels of educational attainment where comparisons are possible, but the largest gap was only $1,100 among males with 1 to 3 years of college. The situation for service workers (fig. 14-7) was more varied. At the two lowest levels of educational attainment the differences between Anglos and Mexican-Americans decreased, but at the next three levels of education they increased. Yet, at the level of 4 years of college or more (where there were not sufficient numbers of Mexican American workers for a comparison in 1959), the difference in 1969 between Anglos and Mexican-Americans was a mere $100.

The least amount of ethnic differentiation by income in 1959 was found among laborers, a pattern holding true generally for 1969 (fig. 14-8). However, while the maximum difference in this occupational category in 1959 was about $600 for workers with 1 to 3 years of high school, by 1969 the maximum difference was $1,000 among laborers with 0 to 7 years of school. Furthermore, at all educational levels where comparisons were possible, the differences in average income between the ethnic groups increased during the 1960's.

The above examination suggests that in 1969 at every level of educational attainment in every occupational category, with only one exception, Anglo male workers earned more on the average than Mexican-American workers. Furthermore, the differences by occupation and education have increased for the most part since 1959.

We shift our analysis here to Anglo / Mexican- American earnings differences excluding the effects of both occupational and educational composition. In other words, if Mexican-Americans were characterized by the same occupational and educational distributions as Anglos, would there remain a difference in average earnings between them in 1969? If yes, to what extent has this difference changed since 1959?

The compositional effects of occupation and education may be removed by decomposing the difference between Anglo and Mexican American income into two terms: One expresses the total difference attributable to Anglo / Mexican-American differences in educational and occupational structures (i.e., the compositional effect), and the other represents the differences resulting from Anglo/ Mexican-American differences specific to occupation and education (i.e., the net effect).*

The total income difference in 1969 (in 1959 dollars) between Anglo and Mexican-American full-time male workers between the ages of 30 and 50, in the urban occupations, residing in one of the five Southwestern States was $3,237. Differences in education and occupational structure account for 58 percent of this difference (or $1,889). The balance, $1,348, it is suggested, may possibly be ascribed to minority group membership.* This difference of over $1,300 remains after controlling for occupation and education. In addition, this difference does not result from the fact that Mexican Americans are characterized by more part-time employment than Anglos, by more agricultural workers, and by an over-representation of younger persons; the sample has been defined in such a way that workers with the above characteristics were excluded. Accordingly, we infer that the nearly $1,350 balance may be due mainly, if not exclusively, to minority group membership.

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*See reference 26, pp. 705-708 for a complete statement on the decomposition process. The methodology employed was adapted from reference 13. Other procedures that could have been used include regression standardization, among other techniques. For a review of these procedures and an application see reference 38.

Clearly, a rather substantial difference exists between the average incomes of Anglo and Mexican-American male workers. An especially intriguing concern, however, is with the extent to which this difference has changed between 1959 and 1969. We began this analysis with the expectation that the "cost" of being an older Mexican-American worker may well have remained the same or increased between 1960 and 1970, since men between the ages of 30 and 50 in 1970 were not as likely as younger men to benefit from the civil rights legislation and the Chicano movement of the 1960's.

The 1970 census data examined suggest indirect support for this hypothesis. The total difference between the average incomes of Anglo and Mexican American workers in 1959 was $2,050; after removing the effects of occupation and education, a balance of $909 remained.[36] The balance of $1,348 in 1969 is over $400 greater than the $909 in 1959. We suggest therefore that not only does there exist an economic cost for being a Mexican American, but it appears from our data that the cost increased by about 48 percent between 1959 and 1969.

DISCUSSION AND CONCLUSION

Mexican-Americans' income rose substantially between 1959 and 1969, even when these changes are examined in constant (i.e., 1959) dollars. Yet in terms of economic increases relative to the Anglo population, Mexican Americans lost ground during the 1960's.

If the findings from this and similar studies are correct, then there remain numerous unanswered questions to be pursued by social demographers as they attempt to relate demographic and sociological variables and processes to one another. Several possible research questions emerge.

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*For the sake of comparison, the 1969 analysis was conducted in 1969 dollars. The total difference between Anglo and Mexican-American workers was $3,941; of this amount $2,295 was contributed to compositional effects; thus, in 1969 the cost of being a Mexican-American in 1969 dollars was $1,646.

Why is the earnings difference between 30- and 50-year old Anglo and Mexican-American workers in 1970 greater than that reported for the same cohort in 1960? Are younger Mexican- Americans more likely to benefit from the Chicano movement and civil rights legislation than the older minority group members? Is more time needed for social and legislative changes to have an effect on the earnings of older Mexican-American workers? Is it possible that additional factors, such as length of residence, need to be built into the analysis? It is at this point that the researcher may decide to seek answers to these questions by reevaluating current research methodologies, by examining the census data in more detail, or by going beyond the census reports or tape files using historical documents, conducting personal interviews, or drawing upon other aggregated data sets.

EDITOR'S NOTE ON SPANISH ANCESTRY POPULATION DATA USE

Chapter 6 reviewed a number of limitations and cautions regarding the use of census data. Poston's article highlights some interesting and difficult questions that census data users, particularly those working with Spanish ancestry populations, must face.

Who Are Mexican-Americans?

Poston has used the identifier "Spanish surname" as a proxy for Mexican-American because he wanted to compare earnings for 1960 and 1970 in five Southwestern States. There are other Spanish ancestry population identifiers that are available from the 1970 census. None of the identifiers, however, include "Mexican-Americans" as a distinct category.

The identifier with the longest history of census use is that of birthplace of the individual and his parents. This question provides information on the first- and second-generation immigrant groups from foreign Spanish countries and Puerto Rico.

The Spanish language identifier, obtained through asking persons to report their mother tongue, provides indicators of Spanish language usage and background for persons who not only had Spanish mother tongue themselves but for those who were living in families where the head or wife was of Spanish mother tongue.

Identification through Spanish surname, used only in the five Southwestern States, provided historically comparable 1970 data, with data for 1950 and 1960, when similar identification was made. Spanish surname identification also permits comparison of Spanish ancestry statistics from administrative records—where surname is the only ethnic identifier—with Spanish surname base data collected in the decennial census.

Another Spanish ancestry question in 1970 asked "Is this person's origin or descent _____" followed by choices of "Mexican," "Puerto Rican," "Cuban," "Central South American," "Other Spanish," or "None of these." This question provides data on each separate group and is not restricted to place of birth, language, or surname.

The term Spanish heritage is a composite term of the major identifiers.

The choice of Spanish ancestry identifiers is confounded by two other issues. *First, does the chosen identifier accurately represent the population under study?* A study ("Comparison of Persons of Spanish Surname and Persons of Spanish Origin in the United States", Technical Paper 38) based upon the March 1971 Current Population Survey found that among men of Mexican origin in the United States in March 1971, 76.6 percent had a Spanish surname. *Second, is the most appropriate identifier available for the geographic region under study? (See table 14-1.)*

Table 14-1. 1970 Census Spanish Ancestry Population Identifiers, by Geographical Area of Major Tabulation and Census Sample Size: April 1970

Identifier	Geographical areas in which major tabulations of the identifiers are presented	1970 census sample size
Birth or parentage	Mid-Atlantic States (New York, New Jersey, and Pennsylvania)	15%
Spanish surname and Spanish language or surname	Five Southwestern States (Arizona, California, Colorado, New Mexico, and Texas)	15%
Spanish language	Remaining 42 States and District of Columbia	15%
Spanish origin	Each of the fifty States in the United States and total United States	5%
Spanish heritage	Total United States	15%

Are the Data Comparable From One Census To Another?

Poston chose the Spanish surname identifier because he wanted to examine both 1960 and 1970 data. The following explanation suggests that the surname identifier is a reasonable choice; however, there were subtle differences in the ways that the data were coded for those years.

Identification by Spanish surname was first used by the Bureau of the Census in the 1950 Census of Population and later in the 1960 and 1970 censuses. Persons of Spanish surname were identified only in the five Southwestern States of Arizona, California, Colorado, New Mexico, and Texas because of the frequent occurrence in other States of surnames identical to Spanish surnames but belonging to other ethnic groups (e.g., Italian, Portuguese, and English).

In the censuses of 1950, 1960, and 1970, a manual coding operation was used to identify Spanish surnames. A list of about 8,000 Spanish surnames originally compiled by the Immigration and Naturalization Service and updated by the Bureau of the Census was used in the coding process.

Although the manual coding operation of Spanish surnames has not changed substantially since 1950, the content of the list was expanded for 1970 by adding surnames that had 25 or more listings in the 1962 edition of the Havana, Cuba, telephone directory, and in the 1970 editions of the San Juan, Puerto Rico, and Mexico City, Mexico, telephone directories. Additions to the list were also made through checking surnames with reported ethnic background in the 1968 October–December Urban Employment Survey, and by including surnames from a study by Charles R. Maduell entitled *The Romance of Spanish Surnames*, New Orleans, La., 1967. Moreover, in addition to coding as Spanish those names on the census questionnaires that were on the list, coders were instructed to code as Spanish any surname with endings in a, es, n, no, os, s, or z in which the preceding part of the name appeared on the list. Surnames on the questionnaires with a prefix of De, Del, De La, De Las, or De Los, in addition to the name on the list, were coded as Spanish. The name "Martin," a special case, was coded as Spanish if (1) the person surnamed "Martin" or either of his parents was born in a Spanish-speaking country of America or in Spain, (2) the person indicated that Spanish was his mother tongue, or (3) the person reported he was of Spanish origin.

The format of the Spanish surname list was also changed for the 1970 census. Similar Spanish surnames that appeared on lists for the 1950 and 1960 census were combined into a single entry for the 1970 list. For example, the surnames Abel, Abela, and Abelas, which appeared separately in the previous lists, were condensed for 1970 into one line as Abel (a) (as).

Are the Concepts of Race and Ethnicity Used Properly?

Poston's study was limited to "Mexican Americans" as identified by the proxy measure "Spanish surname." Appropriately, his study did not use the concepts of ethnicity and race interchangeably. This is an important distinction because the Spanish population classifiers refer to an ethnic and not a racial designation. Persons of Spanish heritage can be of any race and are thus also included in the "white," "black," and "other" racial categories in the 1970 census. It is for this reason that Poston used data from both the race and ethnicity census questions to identify the "Anglo American" population. Specifically, he defined "Anglo American" as white persons without Spanish surname.*

Are Proper Methodologies Utilized in the Analysis?

A variety of statistical methodologies have been developed for the analysis of data sets. Poston's analysis used only means and graphic displays to illustrate the fact that the Public Use Microdata Samples can be utilized by students to examine topics of considerable interest. The same can be said for the other types of data sets available from the census. However, his study did not attempt to determine if the earnings differences noted with the means and values presented on the graphic displays were statistically significant. A more detailed analysis of this topic is referenced in the article by Poston, Alvirez, and Tienda (reference 37).

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*The Anglo American designation is a common one used in academic studies of the white population in the Southwestern United States. Operationally, Anglo American is defined as white persons without Spanish surname.

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APPENDIX A

POPULATION AND HOUSING ITEMS ON GENERAL SCHEDULES: 1790 - 1970

POPULATION ITEMS ON GENERAL SCHEDULES

Excludes identification items, screening questions, and other information collected but not intended for tabulation. For exact wording of the questions, see "Principal Data-Collection Forms . . . ," page 41.

	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Demographic Characteristics																			
Age	–	X[1]	X[1]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sex	X[1]	X[1]	X[1]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Color or race	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
If American Indian, proportions of Indian or other blood	–	–	–	–	–	–	–	–	–	•	•	•	•	–	X	–	•	–	–
Tribe	–	–	–	–	–	–	–	–	–	•	•	•	•	–	X	–	•	–	X
Relationship to head of family or household	–	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X	X	X
Married in past year	–	–	–	–	–	–	X[2]	X[2]	X	X	X	–	–	–	–	–	–	–	–
Marital status	–	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X	X	X
No. of years married	–	–	–	–	–	–	–	–	–	–	–	X	X	–	–	–	Xs	–	–
Age at or date of first marriage	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X	Xs	–	Xs	Xs
Married more than once	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs	Xs	Xs	Xs
If remarried, was first marriage terminated by death?	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs
No. of years widowed, divorced, or separated	–	–	–	–	–	–	–	–	–	–	[illegible]	–	–	–	–	–	Xs	–	–

POPULATION ITEMS ON GENERAL SCHEDULES -- Continued

Social characteristics	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Free or slave	X	X	X	X	X	X	X	X	–	–	–	–	–	–	–	–	–	–	–
Per slave owner, no. of slaves	–	–	–	–	–	–	X	X	–	–	–	–	–	–	–	–	–	–	–
No. of fugitives	–	–	–	–	–	–	X	X	–	–	–	–	–	–	–	–	–	–	–
No. of manumitted	–	–	–	–	–	–	X	X	–	–	–	–	–	–	–	–	–	–	–
Physical and mental handicaps and infirmities																			
Deaf or deaf mutes	–	–	–	–	X	X	X	X	X	X*	X*	*	X*	*	*	–	–	–	–
Blind	–	–	–	–	X	X	X	X	X	X*	X*	*	X*	*	*	–	–	–	–
Insane	–	–	–	–	–	X[3]	X	X	X	X*	X*	–	*	–	–	–	–	–	–
Feeble-minded (idiotic)	–	–	–	–	–	X[3]	X	X	X	X*	X*	–	*	–	–	–	–	–	–
How supported (insane and idiotic only)	–	–	–	–	–	X	–	–	–	*	*	–	–	–	–	–	–	–	–
Ill or disabled	–	–	–	–	–	–	–	–	–	X*	X*	–	*	–	–	–	–	–	X[5]
Duration of disability	–	–	–	–	–	–	–	–	–	–	X*	–	*	–	–	–	–	–	X[5]
Paupers	–	–	–	–	–	–	X[2]	X[2]	–	*	X*	–	*	–	–	–	–	–	–
Convicts	–	–	–	–	–	–	X[2]	X[2]	–	*	X*	*	*	–	–	–	–	–	–
Homeless children	–	–	–	–	–	–	–	–	–	*	X*	–	*	–	–	–	–	–	–

POPULATION ITEMS ON GENERAL SCHEDULES -- Continued

Social characteristics - con	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Education																			
Literacy	–	–	–	–	–	X[1]	X[2]	X[2]	X	X	X	X	X	X	X	–	–	–	–
School attendance	–	–	–	–	–	–	X[2]	X[2]	X	X	X	X	X	X	X	X	Xs	Xs	Xs
Educational attainment	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X	Xs	Xs	Xs
Public or private school	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs	Xs
Vocational training	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs
Place of birth	–	–	–	–	–	–	X[2]	X[2]	X	X	X	X	X	X	X	X	X	Xs[4]	Xs
Place of birth of parents	–	–	–	–	–	–	–	–	X[5]	X	X	X	X	X	X	Xs	Xs	Xs	Xs
Citizenship	–	–	–	X	X	–	–	–	X[6]	–	X	X	X	X	X	X	X	X[4]	Xs
Year of naturalization	–	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–	–	–	–
Eligibility to vote	–	–	–	–	–	–	–	–	X[6]	–	–	–	–	–	–	–	–	–	–
If foreign born, year of immigration	–	–	–	–	–	–	–	–	–	–	X	X	X	X	X	–	–	–	Xs
Language	–	–	–	–	–	–	–	–	–	–	X	X[7]	X	X[7]	X[7]	Xs	–	Xs	Xs
Language of parents	–	–	–	–	–	–	–	–	–	–	–	–	X	X	–	–	–	–	–
Spanish origin or descent	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs
No. of children living	–	–	–	–	–	–	–	–	–	–	X	X	X	–	–	–	–	–	–

POPULATION ITEMS ON GENERAL SCHEDULES -- Continued

Social characteristics--con.	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
No. of children ever born to mother	–	–	–	–	–	–	–	–	–	–	X	X	X	–	–	Xs	Xs	Xs	Xs
Veteran status	–	–	–	–	–	X	–	–	–	–	X*	–	X	–	X	Xs	Xs	Xs	Xs
Whether wife or widow of veteran	–	–	–	–	–	–	–	–	–	–	X*	–	–	–	–	Xs	–	–	–
If child of veteran, is father dead?	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs	–	–	–
Farm residence	–	–	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	Xs[8,9]	X[9]
Farm residence in a previous year	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X	Xs	–	–
Place of residence in a previous year	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X	Xs	Xs	Xs
Year moved to present residence	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Xs	Xs
Economic characteristics																			
Industry	–	–	–	X	–	X	–	–	–	–	–	–	X	X	X	X	X	Xs	Xs
Occupation	–	–	–	–	–	–	X[2]	X[2]	X	X	X	X	X	X	X	X	X	Xs	Xs
Class of worker	–	–	–	–	–	–	–	–	–	–	–	–	X	X	X	X	X	Xs	Xs
Private or public non-emergency work, or public emergency work	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–	–
Employment status	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X*	X	X	Xs	Xs

POPULATION ITEMS ON GENERAL SCHEDULES -- Continued

Economic characteristics—con.	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Duration of unemployment	–	–	–	–	–	–	–	–	–	X	X	X	X	–	•	X	X_s	–	–
Year last worked	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s	X_s
Weeks worked in preceding year	–	–	–	–	–	–	–	–	–	–	–	–	–	–	•	X	X_s	X_s	X_s
Hours worked in preceding week	–	–	–	–	–	–	–	–	–	–	–	–	–	–	•	X	X	X_s	X_s
Activity 5 years ago	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s
Industry 5 years ago	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s
Occupation 5 years ago	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s
Class of worker 5 years ago	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s
Value of real estate	–	–	–	–	–	–	X^2	X^2	X	–	–	–	–	–	–	–	–	–	–
Value of personal property	–	–	–	–	–	–	–	X^2	X	–	–	–	–	–	–	–	–		
Income	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X	X_s	X_s	X_s
Social Security:																			
Registered	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s	–	–	–
Deductions from all or part of wages or salary	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s	–	–	–
Place of work	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s	X_s
Means of transportation to work	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	X_s	X_s

[a] See also supplemental questionnaires

[s] Sample question

[1] Free white persons only

[2] Question only asked of free inhabitants

[3] Question was whether insane or idiotic

[4] In 1960 place of birth was asked on a sample basis generally, but on a 100-percent basis in New York and Puerto Rico. Citizenship was asked only in New York and Puerto Rico, where it was a 100-percent item.

[5] Question was only whether parents were foreign born

[6] For males 21 years of age or over

[7] Whether person could speak English. In 1900 this was the only question; in 1920 and 1930 this question was in addition to request for mother tongue.

[8] Asked only outside cities

[9] On housing portion of questionnaire

HOUSING ITEMS ON GENERAL SCHEDULES

Excludes identification items, screening questions, and other information collected but not intended for tabulation. There were no housing items in the censuses of 1790-1850 or 1870-1880. For exact wording of the questions, see "Principal Data-Collection Forms . . . . ." page 41.

	1860	1890	1900	1910	1920	1930	1940	1950	1960	1970
Occupancy characteristics										
No. of slave houses (only housing question asked in 1860 census)	X	–	–	–	–	–	–	–	–	–
Farm or nonfarm		X	X	X	X	X	X	Xs	Xs	Xs
Occupied or vacant		–	–	–	–	–	X	X	X	X
Tenure - owned or rented		X	X	X	X	X	X	X	X	X
Owned free or mortgaged		X	X	X	X	–	X	X	–	–
Year-round or seasonal (for vacant only)		–	–	–	–	–	X	X	X[1]	X
Vacancy status (for sale, for rent, etc.)		–	–	–	–	–	X	X	X	X
Duration of vacancy		–	–	–	–	–	–	–	Xs	X
Second home		–	–	–	–	–	–	–	–	Xs
Structural characteristics										
Type of structure (single, semi-detached, trailer, etc.)		–	–	–	–	–	X[2]	X	X	Xs
No. of rooms		–	–	–	–	–	X	X	X	X
No. of bedrooms		–	–	–	[illegible]	–	–	–	Xs	Xs

HOUSING ITEMS ON GENERAL SCHEDULES--Continued

Structural characteristics–con.	1890	1900	1910	1920	1930	1940	1950	1960	1970
Year built	–	–	–	–	–	X	X	Xs	Xs
Original purpose of building	–	–	–	–	–	X	–	–	–
Exterior material	–	–	–	–	–	X	–	–	–
Whether 10 or more units at this address	–	–	–	–	–	–	–	–	X
No. of units in structure	–	–	–	–	–	X	X	Xs	Xs
Mobile home or trailer	–	–	–	–	–	–	X	Xs	Xs
Mobile or fixed	–	–	–	–	–	–	–	Xs	–
Basement	–	–	–	–	–	–	–	Xs	X
No. of stories	–	–	–	–	–	–	–	–	Xs
Elevator (in structures of 4 or more stories)	–	–	–	–	–	–	–	Xs	Xs
Access to unit	–	–	–	–	–	–	–	X	X
Condition and plumbing facilities									
Condition	–	–	–	–	–	X	X	X	–
Water supply	–	–	–	–	–	X	X	X	X
Toilet facilities	–	–	–	–	–	X	X	X	X
Bathing facilities	–	–	–	–	–	X	X	X	X
No. of bathrooms	–	–	–	–	–	–	–	Xs	Xs

HOUSING ITEMS ON GENERAL SCHEDULES-- Continued

Condition and plumbing facilities --con	1890	1900	1910	1920	1930	1940	1950	1960	1970
Source of water	–	–	–	–	–	–	–	Xs	Xs
Sewage disposal	–	–	–	–	–	–	–	Xs	Xs
Equipment and fuels									
Lighting	–	–	–	–	–	X	Xs	–	–
Heating equipment	–	–	–	–	–	X	Xs	Xs	Xs
Heating fuel	–	–	–	–	–	X	Xs	Xs	Xs
Cooking fuel	–	–	–	–	–	X	Xs	Xs	Xs
Water heating fuel	–	–	–	–	–	–	–	Xs	Xs
Refrigeration	–	–	–	–	–	X	Xs	–	–
Kitchen sink	–	–	–	–	–	–	Xs	–	–
Kitchen, cooking facilities	–	–	–	–	–	–	–	X	X
Radio sets	–	–	–	–	X	X	Xs	Xs	Xs[3]
Clothes washing machine	–	–	–	–	–	–	–	Xs	Xs
Clothes dryer	–	–	–	–	–	–	–	Xs	Xs
Home food freezer	–	–	–	–	–	–	–	Xs	Xs
Telephone available	–	–	–	–	–	–	–	Xs	X
Air conditioning	–	–	–	–	–	–	–	Xs	Xs
Television sets	–	–	–	[illegible]	–	–	Xs	Xs	Xs

HOUSING ITEMS ON GENERAL SCHEDULES -- Continued

Equipment and fuels—con.	1890	1900	1910	1920	1930	1940	1950	1960	1970
Whether television equipped for UHF	–	–	–	–	–	–	–	–	X_s
Dishwasher	–	–	–	–	–	–	–	–	X_s
Automobiles	–	–	–	–	–	–	–	X_s	X_s
Financial characteristics									
Value	•	–	–	•[4]	X	X	X	X^5	X
Contract rent	–	–	–	–	X	X	X	X^5	X
If furnished, estimated rent unfurnished	–	–	–	–	–	X	X	–	–
Estimated rent of owned nonfarm home	–	–	–	–	–	X	–	–	–
Gross rent	–	–	–	–	–	X	X	X_s	X_s
Whether mortgaged	–	–	–	X	–	X	–	–	–
Unpaid balance on mortgage or loan	•	–	–	•[4]	–	X	•	•	•
Interest rate on mortgage	•	–	–	•[4]	–	X	•	•	•
Type of mortgage holder	–	–	–	–	–	X	•	•	•
Mortgage payments: Amount and items included	–	–	–	–	–	X	•	•	•

Notes:

- • See supplemental questionnaires
- s Sample question
- [1] Also migratory
- [2] There was also a specific question as to whether dwelling unit was in a residential structure.
- [3] Battery-operated only
- [4] Mortgaged nonfarm home
- [5] 100% in large cities, 25% outside

APPENDIX B

DEPARTMENT AND OFFICIALS RESPONSIBLE FOR THE U.S. CENSUSES, 1790 - 1980

A. Directors of the Census, 1790 - 1900

Year	Department	Official and Title
1790	State	Thomas Jefferson, Secretary[1]
1800	State	John Marshall, Secretary
1810	State	Robert Smith, Secretary
1820	State	John Q. Adams, Secretary
1830	State	Martin Van Buren, Secretary
1840	State	William A. Weaver, Superintending Clerk
1850	Interior	Joseph C.G. Kennedy, Superintendent James D.B. DeBow, Superintendent
1860	Interior	Joseph C.G. Kennedy, Superintendent
1870	Interior	Francis A. Walker, Superintendent
1880	Interior	Francis A. Walker, Superintendent Charles W. Seaton, Superintendent
1890	Interior	Robert P. Porter, Superintendent
1900	Interior	William R. Merriam, Director

B. Directors of the Bureau of the Census, 1902 - 1980

Year	Department	Official and Title
1902 - 1903	Interior	William R. Merriam
1903 - 1909	Commerce and Labor	Simon N.D. North
1909 - 1913	Commerce and Labor	Edward D. Durand
1913 - 1915	Commerce	William J. Harris
1915 - 1921	Commerce	Sam L. Rogers

B. Directors of the Bureau of the Census, 1902 - 1980

(cont.)

Year	Department	Official and Title
1921–1933	Commerce	William M. Steuart
1933–1941	Commerce	William L. Austin
1941 (4 mo.)	Commerce	Vergil D. Reed[2]
1941–1949	Commerce	James C. Capt
1949–1950	Commerce	Philip M. Hauser[2]
1950–1953	Commerce	Roy V. Peel
1953–1961	Commerce	Robert W. Burgess
1961 (3 mo.)	Commerce	Albert R. Eckler[2]
1961–1965	Commerce	Richard M. Scammon
1965–1969	Commerce	Albert R. Eckler
1969–1973	Commerce	George H. Brown
1973–1976	Commerce	Vincent P. Barabba[3]
1976–1977	Commerce	Robert L. Hagan[2]
1977–1979	Commerce	Manuel D. Plotkin
1979 (2 mo.)	Commerce	Robert L. Hagan[2]
1979 (4 mo.)	Commerce	Daniel L. Levine[2]
1979–	Commerce	Vincent P. Barabba

[1] Degree of responsibility of Secretary of State in 1790 is not clear.

[2] Acting Director.

[3] Served as Acting Director before serving as Director.

APPENDIX C

BUREAU SURVEYS

Congress has given the Bureau of the Census an unending mission: to compile statistical information about the population and the way things are going in the Nation. In addition to the censuses, surveys provide an effective tool for obtaining this information.

Surveys differ from censuses in two major respects. First, they are not designed to canvass an entire population—only a sample. Second, although participation in all censuses is mandatory, response to surveys is usually voluntary.

The Current Population Survey reaches about 66,000 of the Nation's households each month. Other surveys involve fewer interviews. Why a sample? Between censuses, it would cost too much in time and taxpayer money to visit every household and business place. Therefore, population samples are scientifically selected so that each address represents many similar units. In this way, the result is an authentic cross section of households, individuals, or whatever group is being surveyed. Information obtained from this kind of cross section is extremely valuable when applied to the Nation as a whole or to large areas such as major regions.

Many Bureau household surveys are recurring—that is, they are conducted at regular or irregular intervals. The people who take part in a recurring survey change from time to time, but the survey itself goes on indefinitely. Other surveys are conducted less often, some only once. All surveys conducted by the Bureau must serve a clear public need. Many are assigned to the Bureau by law or custom, while others are sponsored and paid for by other Government agencies. For example, the **National Health Survey** is conducted by the Bureau for the Department of Health, Education, and Welfare.

The Current Population Survey, the oldest of the Bureau's surveys, is one of the most important sources of timely population information available. Conducted since 1940, it allows the Bureau to make available to the Government, industry, and the general public, current data about social and economic conditions in the United States. Data collected cover a wide range of subjects about the population—education, migration, family size and composition, birth rates, income, and housing vacancies.

The Current Population Survey is also used to collect information for other Government agencies about many subjects covered most effectively through household interviews. Well known in this category are monthly statistics about employment and unemployment. These data are analyzed and published by the Bureau of Labor Statistics of the U.S. Department of Labor. The survey also provides additional labor force data not available through other sources.

In addition, the Current Population Survey (CPS):

Is the only comprehensive source of information on the personal characteristics of the labor force—such as age and sex, race, marital and family status, veteran status, and educational background.

Is the primary source of estimates of the numbers of wage and salaried employees as well as self-employed persons, domestic help, and unpaid helpers in nonfarm family enterprises.

Provides the only available data on the number of workers classified by the number of hours worked, which permits separate analysis of part-time employees, those on overtime, and those in similar categories.

Is the only comprehensive current source of information on the occupational categories of workers—whether engineers, stenographers, carpenters, farmers, laborers, or whatever. And it provides limited statistics on the industries in which these people work.

Provides information about persons outside the labor force, known as the labor reserve: whether they are married women with or without young children, disabled persons, students, older retired workers, or in circumstances of special interest.

How else are **CPS** data used and by whom? In the following ways:

Vocational guidance groups, trade unions, and organizations concerned with minority groups look to **CPS** results to determine job opportunities for the people they represent.

Facts about the living standards of persons with low incomes are developed from the **CPS**. Are these people unemployed? Of a certain racial group? Retired? In large families? In families headed by women? Living on farms? Living in central cities? **CPS** data help identify the characteristics of the poor so that programs to help raise their income levels can be undertaken.

To help persons involved with educational planning, **CPS** provides data on public and private school enrollment trends from nursery school through college, and on the numbers and characteristics of those who have dropped out of school.

To determine benefits for veterans. War veterans of the United States are eligible for various benefits. To anticipate the amount of money required to pay for veterans' educational benefits, hospital care, and retirement benefits, planners rely upon **CPS** estimates of the number of persons eligible to receive such benefits.

To plan old-age benefits. **CPS** supplies data on the age distribution and family status of people across the United States. The information is used to determine the amount of Social Security and State old-age benefits required for those eligible.

The data are valuable to private industry, too. Baby food and children's clothing manufacturers use **CPS** figures on new marriages and ages of children to plan changes in production capacity and marketing techniques.

The **National Immunization Survey**, conducted as a supplement to the Current Population Survey is a key to health programs geared to disease prevention. Recent data gathered on the increasing number of children immunized against measles indicated that this disease, with its serious side effects, is being brought under control. **CPS** data also indicate the numbers and general location of children not yet immunized, so that health programs can be concentrated in those areas. Similar information is gathered on polio, diphtheria, tetanus, whooping cough, and flu.

Each January, April, July, and October, Census Bureau interviewers taking the **Quarterly Household Survey** visit 6,000 sample households to ask the occupants how much they spend for additions, alterations, and repairs to their properties. With this information, changes in the amounts spent for residential property upkeep are related to changes in the whole national economy. As the U.S. population grows and its stock of housing expands, these expenditures become increasingly important.

Continuing measures of the changes are watched very closely in the Government and private industry. For example, the Department of Housing and Urban Development uses the figures to measure the need for and effectiveness of programs designed to assist people in maintaining and improving the quality of their homes. The National Home Improvement Council and the National Association of Home Builders use the figures to keep abreast of changing requirements for materials used in home upkeep. Lumber and building materials companies, furnace and air-conditioning companies, even manufacturers of bathroom fixtures, all need the information to determine what quantities of their products are required for new construction as well as for work done on established homes.

Quarterly Housing Survey interviewers also collect such information about occupied housing units as the number of rooms, presence or absence of plumbing facilities, the number of units in the building, and the amount of rent or current value of the property. This information is combined with data on vacant housing units from the **Current Population Survey** in order to compare the characteristics of occupied and vacant units and to determine the housing vacancy rate. The vacancy rate is one measure of the supply and demand for housing. It indicates whether there is a shortage or a surplus of vacant rental units—apartment buildings or single-family homes—in residential properties. These data are used by the Department of Housing and Urban Development and other Federal agencies, by local agencies such as city planning commissions, and by private builders and lenders as well.

A major survey developed in response to a long-standing need for frequent and up-to-date information on the Nation's housing supply is the **Annual Housing Survey.** The availability of adequate housing for the Nation's growing population is of mounting concern. Information about the physical condition of occupied and vacant units is essential. This survey also helps to measure changes in the housing inventory resulting from losses, new construction, mobile home placements, and demographic characteristics of the occupants.

The Bureau conducts this survey for the Department of Housing and Urban Development. It bridges the gap in current housing information between decennial censuses. There are two samples involved. One is a national sample of approximately 79,000 units. The second consists of about 105,000 units in 20 Standard Metropolitan Statistical Areas each year, with a total of 60 selected SMSA's surveyed covering 4 years.

Healthy people are one of the Nation's greatest resources. Moreover, a high priority on health is justifiably viewed either in terms of the cost of illness or of the less tangible benefits of national vigor, morale, individual well-being, and other human values. It follows that comprehensive health statistics are needed to keep track of this vital resource. Three major Bureau efforts to obtain useful health information are the **Health Interview Survey**, the **Health Examination Survey**, and the **Hospital Discharge Survey**, all conducted for the National Center for Health Statistics of the U.S. Department of Health, Education, and Welfare.

In the **Health Interview Survey**, information is collected through household interviews. This survey currently reaches about 41,000 households every year. The data include facts on health and on population characteristics related to illness, injury, and disability, as well as the cost and uses of medical services.

Health Examination Survey data are collected through personal interviews and direct examination of population samples by teams of physicians, The health surveys provide information for many purposes, including:

1. *Planning and evaluation of official and voluntary programs*—Public health officials use survey statistics to identify problems of public health and to determine how resources should be used. Trends in disease outbreak or control help to design and evaluate prevention programs and to determine effectiveness of new treatments.

2. *Evaluation of medical and dental services*—Health data help to estimate the need for hospital and rehabilitation services and to identify areas of emphasis in medical and nursing training. Statistics on the frequency of chronic disease, injuries, and resulting disabilities are important in considering the expansion of medical insurance and employee compensation programs. Data are gathered on the number of people covered by various insurance plans, sums spent, methods of payment, and the degree to which various income and occupation groups use medical services.

3. *Medical research*—The health surveys provide data needed to investigate factors related to disease such as age, sex, marital status, occupation, and economic status. Statistics are also compiled on the geographic distribution of such health problems as allergies, nutritional diseases, and nephritis, in an effort to provide clues as to their causes.

4. *Manpower problems and civilian defense*—Statistics are gathered on absenteeism resulting from disease and injury for use in estimating the economic loss to industry. Information is also compiled on the number of persons with chronic diseases and handicapping conditions. Together with data on employment status, this provides an estimate of potential additions to the labor force. For the armed services, an estimate can be made of the number of young men who might serve in limited duty categories. For the use of both industry and the armed services, data are collected on the personnel and facilities required to correct handicaps.

5. *Needs of drug firms and appliance manufacturers*—Data on disabilities, the frequency of particular operations and prescriptions, use of hearing aids, artificial limbs, and other such devices help drug firms estimate the markets for their preparations and appliances.

6. *Public health education*—Finally, all of the information is used in planning advertising campaigns for public health education. Accident prevention agencies use health survey figures to estimate the national incidence of accidental injuries by type and degree. Statistics are gathered on the number of cases of cerebral palsy, multiple sclerosis, blindness, deafness, and other diseases and impairments for use by voluntary health agencies concerned with these conditions.

To round out the picture of the Nation's economy, data about business must be added to knowledge of consumer income and spending. The Census

Bureau makes a major contribution through its current business surveys. The firms participating in these surveys constitute a valid cross section of the Nation's retail, service, and wholesale establishments. Both large and small businesses and new and old firms are included in the sample. About 12,000 retail, 2,500 service, and 4,000 wholesale reports are collected each month, most taken by mail and telephone, with a few by personal interview.

The **Retail Trade Survey** covers all categories of retail business—food stores, eating and drinking places, general merchandise and department stores, variety and apparel stores, furniture and appliance dealers, lumberyards and building materials dealers, hardware stores, new and used car dealers, gasoline service stations, and so on. Data are published in the **Monthly Retail Trade** report which provides estimated national and regional sales figures for each kind of business. The report shows month-to-month and year-to-year percentage changes in sales by kind of business for the Nation and for selected areas. It also gives data by kind of business on charge accounts, installment accounts, and total receivables. The Bureau also publishes an **Annual Retail Trade** report showing annual sales and purchases and year-end inventories of retail stores by kind of business.

The **Service Trade Survey** provides monthly estimates of receipts for selected services including hotels and motels, personal services, business services, automobile and other repair services, and amusement and recreation services. These are published in the **Monthly Selected Services Receipts** report.

The **Wholesale Trade Survey** covers merchant wholesalers including those who take title to the goods they sell such as jobbers, industrial distributors, exporters, importers, cash-and-carry wholesalers, retail cooperatives, warehouses, terminal elevators, and co-op buying associations. Data published in the *Monthly Wholesale Trade* report show dollar volume estimates of sales and inventories for durable goods, nondurable goods, and both combined. The report gives similar information for major business groups and selected individual kinds of business. In many categories, it shows percentage changes and estimates by geographic area.

Business statistics published in these reports include:

Measures of competitive standing. People engaged in business, whether corporation executive or neighborhood storekeepers, can determine the extent to which changes in the volume of their business reflect general conditions. Thus they can judge the extent to which such conditions indicate a rise or fall in this competitive position.

Decision guides. Business people apply the data to decisions on opening new outlets, discontinuing or consolidating present outlets, and adding or dropping merchandise lines.

Market locators. Manufacturers, retailers, wholesalers, advertising agencies, and others consult data on trends in various parts of the country in order to gear their production and sales efforts to market demand. Costs are lowered when production, distribution, and retail marketing are linked more closely to demand. Increased knowledge of demand also helps avoid costly inventory losses.

Research tools. Many trade and professional associations analyze and interpret the statistics to gauge the significance of fluctuations within their groups. Frequently, they package the information according to the needs of their members. Specialized publications render the same valuable service to all kinds of business enterprises.

The monthly **Survey of Construction** provides information on private residential construction in the United States. Such agencies as the President's Council of Economic Advisors, the Federal Reserve Board, and the Department of Housing and Urban Development make extensive use of these data. In private industry, accurate housing construction data are needed by such groups as the Mortgage Banker's Association, the National Association of Mutual Savings Banks, savings and loan associations, and others. The National Association of Home Builders use survey results to help set reasonable industry goals. Manufacturers of building and construction materials and manufacturers of household furnishings and appliances also use data from the **Survey of Construction**. For example, a manufacturer of washing machines might increase production on the basis of Bureau survey figures showing an increase in the number of new housing units being started.

One objective of the **Survey of Construction** is to provide data for estimating the number of housing units started—both in areas that issue building permits and areas that do not. This information is published in the monthly report, **Housing Starts**. The survey also provides data on housing sales such as the monthly volume of sales of new single-family houses, the number of unsold new homes on the market, sales prices, type of financing, physical characteristics of housing, and inclusion of major appliances. Figures on housing sales also provide the basic data needed to calculate the price index of new one-family homes sold. Data on housing sales are published in **New One-Family Homes Sold and For Sale**. A third objective of the survey is to provide data on the number of single-family houses and apartment buildings completed each month. This information is published in the **Housing Completions**.

Crime in the United States is a matter of national concern. The **National Crime Survey** is an effort to improve existing crime statistics. The purposes of the survey are (1) to measure crime by kinds and numbers of incidents; (2) to obtain, for the first time, data on the socioeconomic characteristics of the victims of crime; and (3) to collect detailed information on the circumstances of crimes beyond that available in existing crime reports. The **National Crime Survey** also serves as a vehicle for obtaining supplemental information relating to crime and the criminal justice system, such as attitudes toward crime and the police. This additional information is collected periodically along with the regular information.

The **National Crime Survey** involves two samples of the population—a national sample and a central cities sample. The results are based on interviews with 60,000 households. People in this sample are asked about crime victimization during the 6-month period prior to the interview.

The Law Enforcement Assistance Administration (LEAA) of the Department of Justice uses the results of this survey to determine the extent and nature of crime in the United States. Such knowledge is useful in planning grants of funds or providing advice to local law enforcement agencies and in evaluating the effect of financial grants or new programs on the rate of crime in given areas. Also, the results are used by criminal justice planners, researchers, academicians, and the public for research into the characteristics of crime and for planning to meet future needs of the criminal justice system.

Cotton is one of the Nation's principal crops. Many people, in cities as well as on farms, need to know how much cotton is being produced at any given time and how much is being used or held in storage. This information, of course, is essential to cotton growers, people in the cotton textile industry, and those who depend on cotton for a livelihood. It is also vital to many Government agencies and the millions of people they serve in agriculture, transportation, consumer information, employment, investment, and research. To serve these people, the Bureau gathers and publishes statistics through the **Cotton Survey**.

The laws authorizing the collection of data on cotton ginned, consumed, and on hand recognize the need to guard against any speculative influence on market prices. With reliable information on the quantity of cotton available, the producer has a guide as to when to dispose of products and how to plan succeeding crops. The manufacturer likewise has information to assist in purchasing or contracting for the manufacture and delivery of goods.

Timing is important. Bureau Regional Offices have about 6 days to obtain reports from the ginners. These are collected twice a month from September through January and once in August, February, and March. Summaries are wired to Washington, D.C., where they are assembled and compiled by the Bureau's Agriculture Division. Special precautions are taken to ensure that information about the crop is kept confidential until the results are ready for official release. In fact, to prevent leaks to cotton market speculators, Bureau employees are locked in a room where they compile the final report.

Reference

Census Surveys: Measuring America. U.S. Department of Commerce, Bureau of the Census, February 1978. 12 pages.

APPENDIX D

1985 MID-DECADE CENSUS

Legislation requiring a mid-decade census of population and housing beginning in 1985 was signed into law in 1976. In approving the mid-decade legislation, Congress avoided establishing by law the scope and content of the program. Rather, the legislation is flexible so that the Census Bureau may take into account the anticipated data needs of the latter half of the 1980's. The law does not require the mid-decade census to duplicate the decennial census, providing that basic objectives are met, e.g., updates of characteristics along with population totals. The updating of census data is particularly important for the distribution of Federal funds and the administration of Federal program benefits to various segments of the population. The legislation also encourages the use of sampling. The law specifically prohibits the use of mid-decade census results for apportioning the House of Representatives or delineating congressional districts. It is anticipated that the mid-decade program will be used to satisfy some of the statistical needs now being met through special intercensal surveys. To the extent that this objective can be achieved, a mid-decade census could include inquiries on subjects which are now contained in special-purpose surveys.

In planning for the mid-decade program, one of the basic decisions that needs to be made is which approach should be used. Should the mid-decade program be a complete count, that is, a census, or should it be a sample survey? For discussion purposes, the Bureau is proposing that the mid-decade program be limited to a sample survey and that data be collected and tabulated for the following geographic levels: States, SMSA's, central cities, and balance of State. It must be emphasized that this is an initial proposal offered primarily to provide a framework to which data users can react. As objectives and data needs are evaluated, it is entirely possible that these goegraphic levels may be modified. The basic purpose of the mid-decade program is to provide the most information in a cost-effective manner.

Planning for the mid-decade program has already begun. Some data needs have been identified, and this effort will continue over the next several months. As these data needs are further refined and as additional needs are identified, specific design proposals for the census will be developed.

Source: 1980 Census Update, Issue No. 13, Jan. 1980.

APPENDIX E

PARTS OF A STATISTICAL TABLE

1. Heading

This is the portion of the table appearing above the body. It comprises the table number, title, and headnote.

a. Table number–An indicator of relative position of the table within a series.

b. Title–A brief statement indicating the nature, classification, and time reference of the data presented, and the political division or physical area to which the data refer.

c. Headnote–A statement enclosed in brackets that appears below the title. It explains, qualifies, or provides information relating to the table as a whole.

2. Stub

It is located to the left of the table, devoted to a listing of line or row captions or descriptions, together with needed classifying and qualifying centered heads and subheads.

a. Stubhead or box–The column head or caption of the stub. It describes the stub listing as a whole.

b. Center head or subhead–A classifying, descriptive, or qualifying statement applying to all subheads and line captions below it until the next center head of coordinate or superior classification is reached.

c. Line caption–The basic unit of the stub. The descriptive title of the data appearing on a given line.

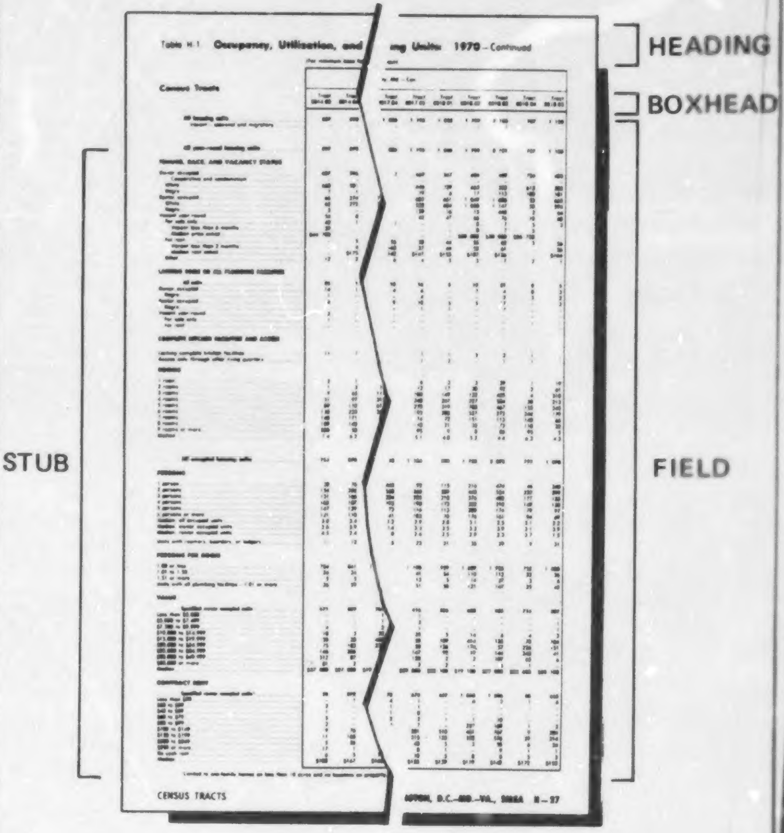
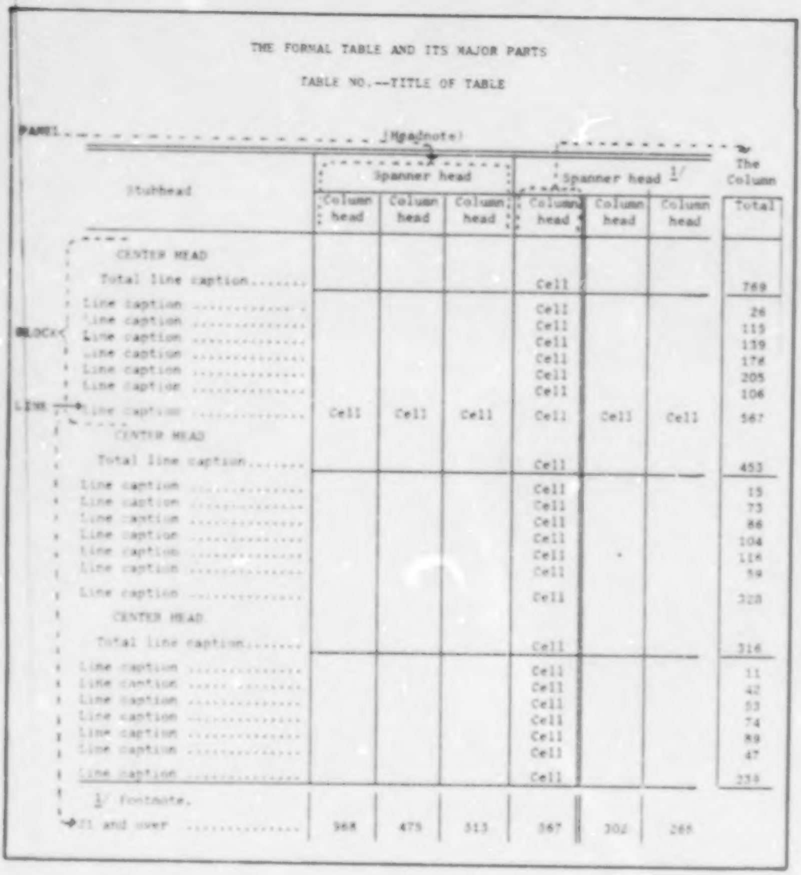

HEADING
BOXHEAD
STUB
FIELD

Table H-1 Occupancy, Utilization, and ing Units: 1970 – Continued

CENSUS TRACTS

NGTON, D.C.—MD.—VA., SMSA H – 27

PARTS OF A STATISTICAL TABLE



THE FORMAL TABLE AND ITS MAJOR PARTS

TABLE NO.--TITLE OF TABLE

(Headnote)

Stubhead	Spanner head			Spanner head 1/			The Column
	Column head	Column head	Column head	Column head	Column head	Column head	Total
CENTER HEAD							
Total line caption				Cell			769
Line caption				Cell			26
Line caption				Cell			115
Line caption				Cell			139
Line caption				Cell			178
Line caption				Cell			205
Line caption				Cell			106
Line caption	Cell	Cell	Cell	Cell	Cell	Cell	567
CENTER HEAD							
Total line caption				Cell			453
Line caption				Cell			15
Line caption				Cell			73
Line caption				Cell			86
Line caption				Cell			104
Line caption				Cell			116
Line caption				Cell			59
Line caption				Cell			328
CENTER HEAD							
Total line caption				Cell			316
Line caption				Cell			11
Line caption				Cell			42
Line caption				Cell			53
Line caption				Cell			74
Line caption				Cell			89
Line caption				Cell			47
Line caption				Cell			239
1/ Footnote.							
21 and over	368	475	313	567	302	265	

d. Block—A distinctive segment of the stub consisting of a group of related line captions with their attendant heads and stubheads; usually a self contained unit.

3. Boxhead

The portion of the table in which are located the individual column heads or captions describing the data in each vertical row or column, together with needed classifying and qualifying spanner heads.

a. Column head or caption—The basic unit of the boxhead. The descriptive title for all data appearing in the given column at the top of which the head appears.

b. Spanner head—A classifying, descriptive, or qualifying caption spreading across one or more column heads, or across one or more lower spanners, applying in varying degree to all columns or subordinate spanner thus covered.

c. Panel—A distinctive segment of the boxhead consisting of a group of related column heads with their attendant spanners; frequently a self-contained unit.

4. Field

The portion of the table extending from the bottom rule of the boxhead to the bottom rule of the table, and to the right of the stub.

a. Cell—The basic unit of tabular presentation. The intersection of any line caption with any column head.

b. Line—A horizontal row of cells with a common classification extending across from a description entry, or line caption, in the stub.

c. Column—A vertical row of cells with a common classification extending down from a description entry, or column head, in the box.

5. Footnote

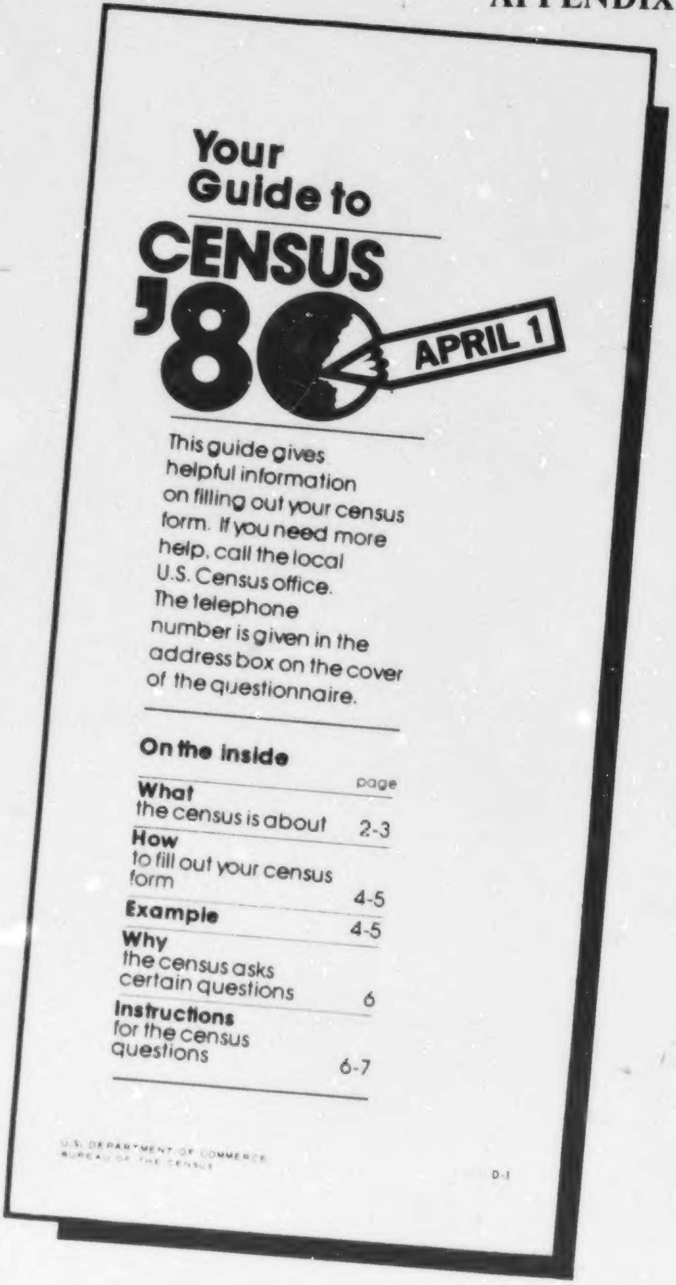
A statement qualifying or explaining the information presented in, or omitted from, a specific cell, column, line, or group of columns or lines.

6. Source Note

An exact citation of the source of the data presented in the table. It may appear as a headnote or in the form of a general note at the bottom of the table. It is preceded by the word "source."

Source: U.S. Department of Commerce, Bureau of the Census, BUREAU OF THE CENSUS MANUAL OF TABULAR PRESENTATION: A Special Report of the Bureau of the Census, 1949, Washington, D.C., Government Printing Office.

APPENDIX F



Your Guide to CENSUS '80

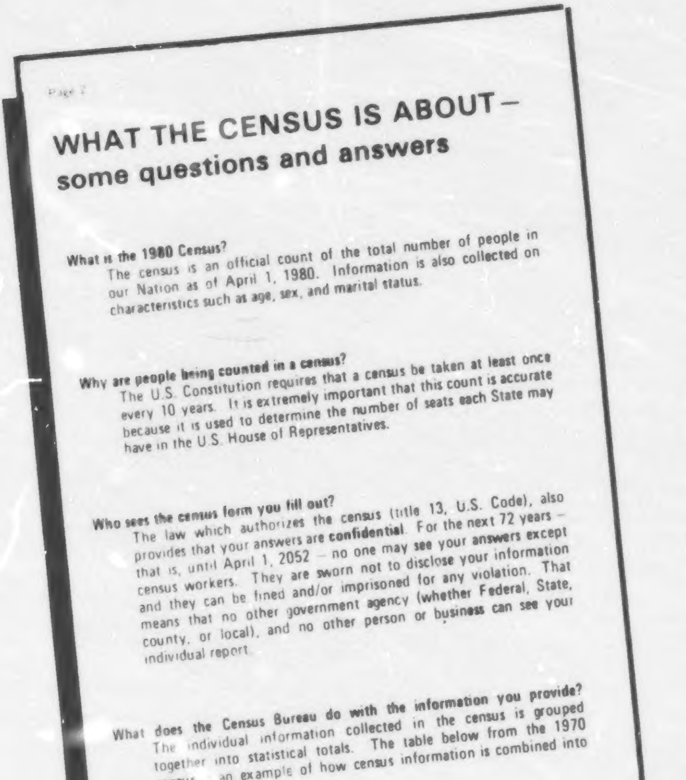
This guide gives helpful information on filling out your census form. If you need more help, call the local U.S. Census office. The telephone number is given in the address box on the cover of the questionnaire.

On the inside

	page
What the census is about	2-3
How to fill out your census form	4-5
Example	4-5
Why the census asks certain questions	6
Instructions for the census questions	6-7

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

D-3



WHAT THE CENSUS IS ABOUT – some questions and answers

What is the 1980 Census?

The census is an official count of the total number of people in our Nation as of April 1, 1980. Information is also collected on characteristics such as age, sex, and marital status.

Why are people being counted in a census?

The U.S. Constitution requires that a census be taken at least once every 10 years. It is extremely important that this count is accurate because it is used to determine the number of seats each State may have in the U.S. House of Representatives.

Who sees the census form you fill out?

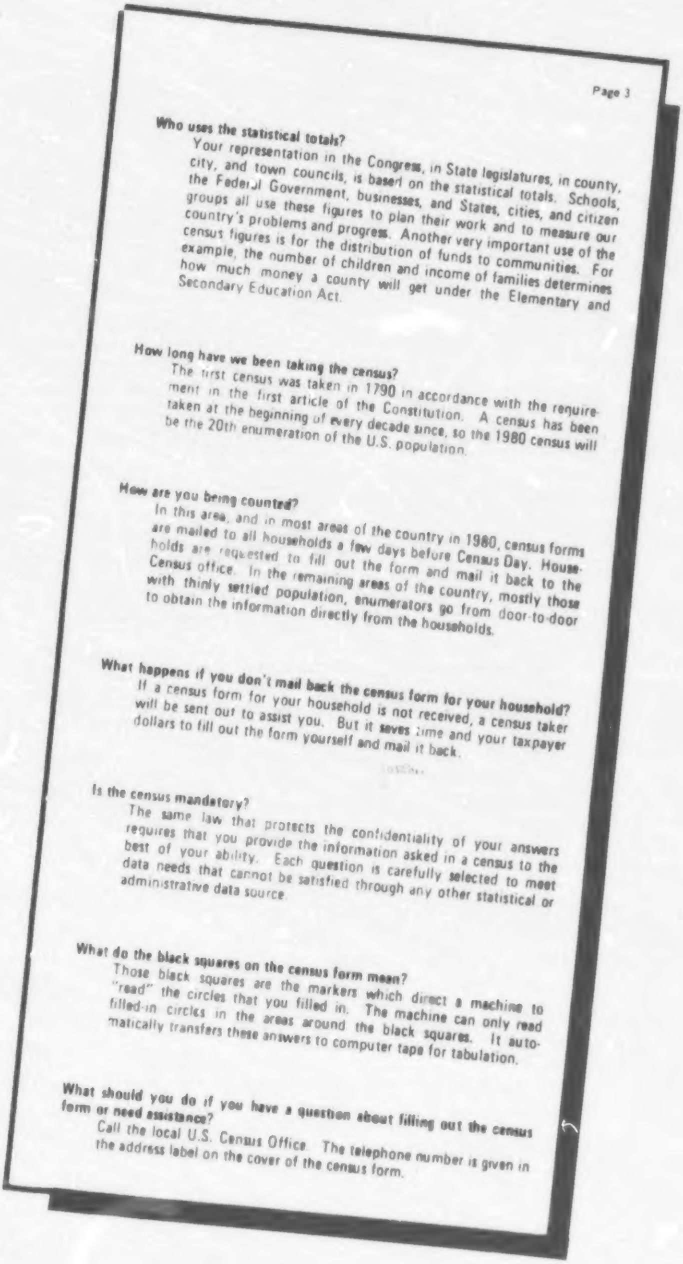
The law which authorizes the census (title 13, U.S. Code), also provides that your answers are **confidential**. For the next 72 years – that is, until April 1, 2052 – no one may see your answers except census workers. They are sworn not to disclose your information and they can be fined and/or imprisoned for any violation. That means that no other government agency (whether Federal, State, county, or local), and no other person or business can see your individual report.

What does the Census Bureau do with the information you provide?

The individual information collected in the census is grouped together into statistical totals. The table below from the 1970 census [illegible] an example of how census information is combined into overall figures.

Number of Persons by Age and Sex: 1970

Age	Male	Female
Total persons in U.S.	98,912,192	104,299,734
Under 5 years	8,745,499	8,408,838
5 to 14 years	20,75[illegible],233	19,986,482
15 to 24 years	17,551,116	17,890,253
25 to 44 years	23,448,593	24,546,641
45 to 64 years	19,992,043	21,817,726
65 to 74 years	5,437,084	6,998,372
75 years and over	2,978,624	4,651,422



Page 3

Who uses the statistical totals?

Your representation in the Congress, in State legislatures, in county, city, and town councils, is based on the statistical totals. Schools, the Federal Government, businesses, and States, cities, and citizen groups all use these figures to plan their work and to measure our country's problems and progress. Another very important use of the census figures is for the distribution of funds to communities. For example, the number of children and income of families determines how much money a county will get under the Elementary and Secondary Education Act.

How long have we been taking the census?

The first census was taken in 1790 in accordance with the requirement in the first article of the Constitution. A census has been taken at the beginning of every decade since, so the 1980 census will be the 20th enumeration of the U.S. population.

How are you being counted?

In this area, and in most areas of the country in 1980, census forms are mailed to all households a few days before Census Day. Households are requested to fill out the form and mail it back to the Census office. In the remaining areas of the country, mostly those with thinly settled population, enumerators go from door-to-door to obtain the information directly from the households.

What happens if you don't mail back the census form for your household?

If a census form for your household is not received, a census taker will be sent out to assist you. But it saves time and your taxpayer dollars to fill out the form yourself and mail it back.

Is the census mandatory?

The same law that protects the confidentiality of your answers requires that you provide the information asked in a census to the best of your ability. Each question is carefully selected to meet data needs that cannot be satisfied through any other statistical or administrative data source.

What do the black squares on the census form mean?

Those black squares are the markers which direct a machine to "read" the circles that you filled in. The machine can only read filled-in circles in the areas around the black squares. It automatically transfers these answers to computer tape for tabulation.

What should you do if you have a question about filling out the census form or need assistance?

Call the local U.S. Census Office. The telephone number is given in the address label on the cover of the census form.

Page 4

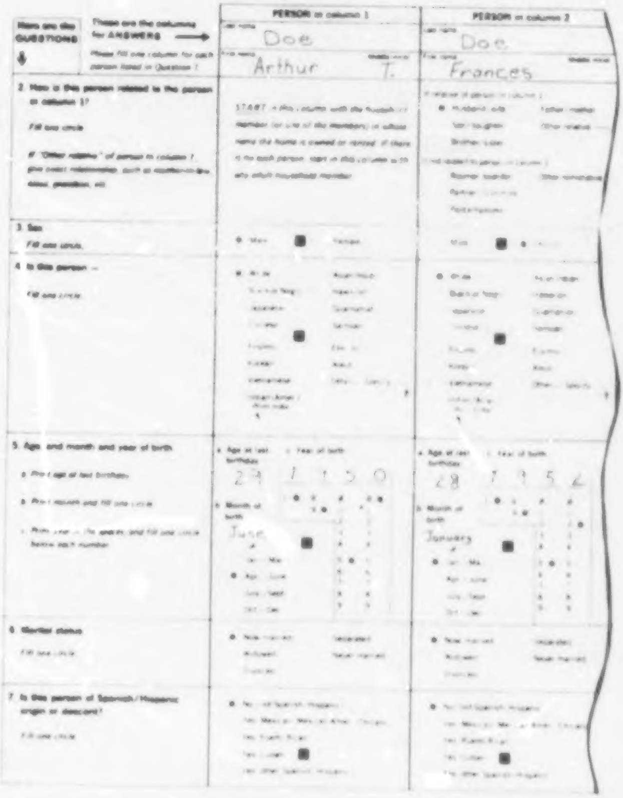
HOW TO FILL OUT YOUR

- There may be a question you cannot answer exactly. For example, you might not know the age of an elderly person or the price for which your house would sell. See if someone else in your household knows; if no one does, give your best estimate.

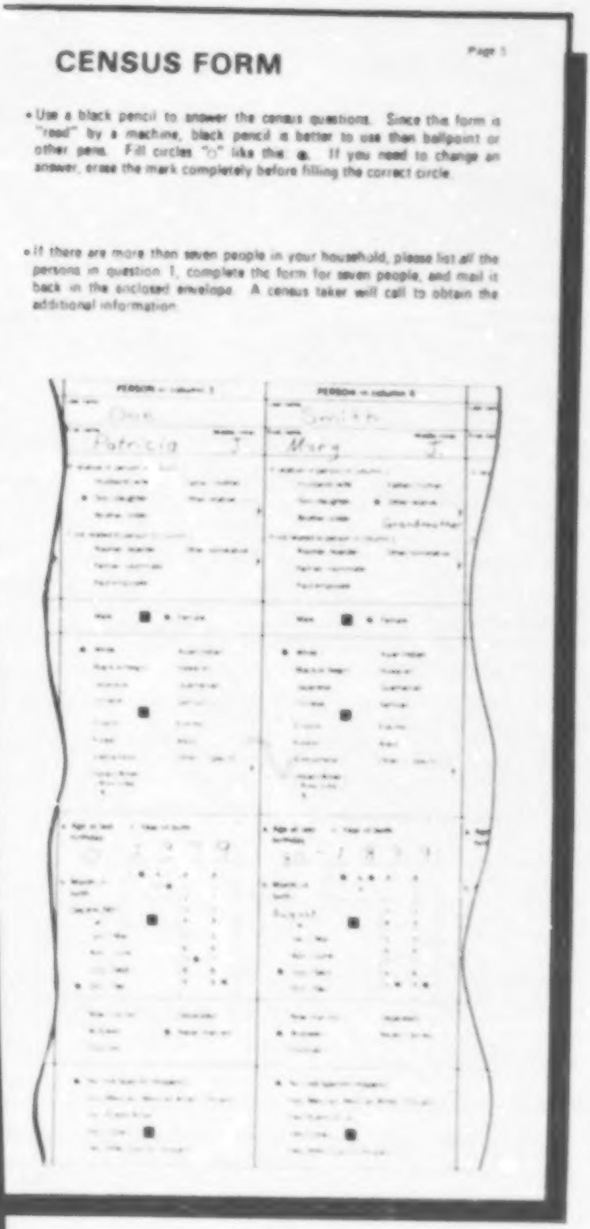
- If someone in the household, such as a roomer or boarder, does not want to give you all the information for the form, write in at least the person's name and answer questions 2 and 3. A census taker will call to get the other information directly from the person.

- If you are not sure if you should list a person, see the rules on page 1 of the census form.

EXAMPLE



Here are the QUESTIONS	These are the columns for ANSWERS →	PERSON in column 1	PERSON in column 2
		Doe	Doe
		Arthur T.	Frances
2. How is this person related to the person in column 1? Fill one circle			
3. Sex Fill one circle			
4. Is this person — Fill one circle			
5. Age and month and year of birth		29 1950 June	28 1952 January
6. Marital status			
7. Is this person of Spanish/Hispanic origin or descent?			



CENSUS FORM

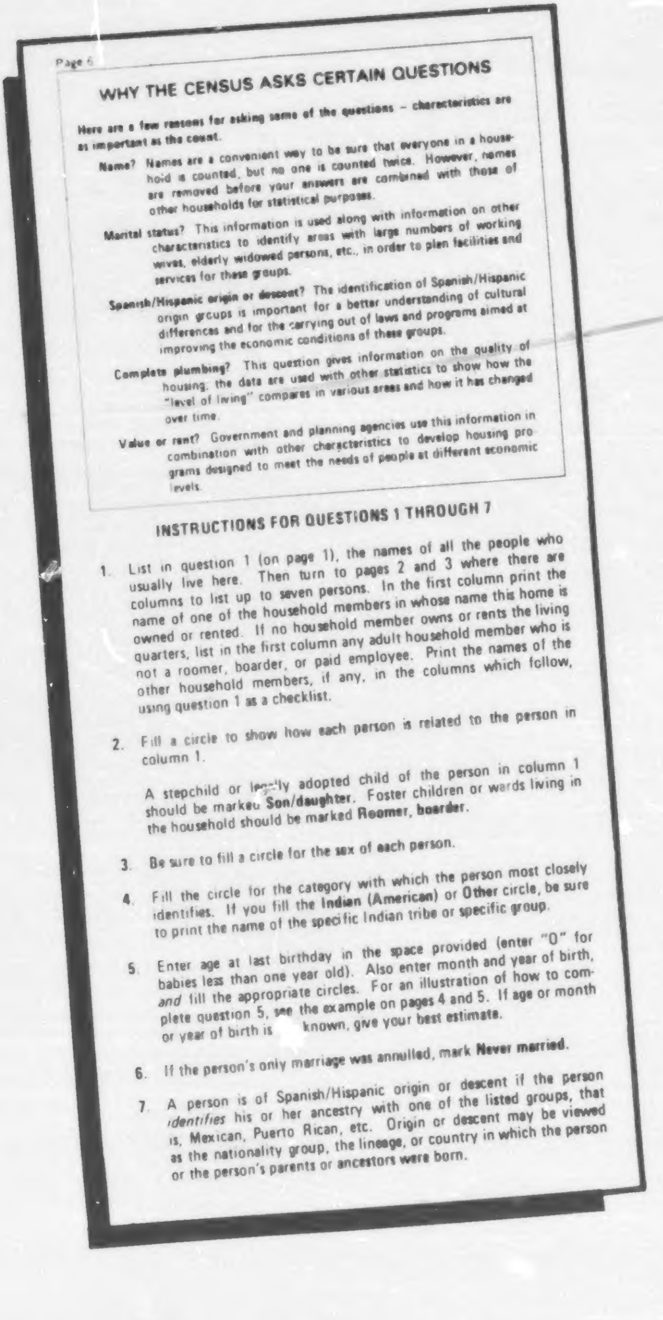
Page 1

- Use a black pencil to answer the census questions. Since this form is "read" by a machine, black pencil is better to use than ballpoint or other pens. Fill circles "○" like this: ●. If you need to change an answer, erase the mark completely before filling the correct circle.

- If there are more than seven people in your household, please list *all* the persons in question 1, complete the form for seven people, and mail it back in the enclosed envelope. A census taker will call to obtain the additional information.

Doe
Patricia J

Smith
Mary J
Grandmother



Page 6

WHY THE CENSUS ASKS CERTAIN QUESTIONS

Here are a few reasons for asking some of the questions – characteristics are as important as the count.

Name? Names are a convenient way to be sure that everyone in a household is counted, but no one is counted twice. However, names are removed before your answers are combined with those of other households for statistical purposes.

Marital status? This information is used along with information on other characteristics to identify areas with large numbers of working wives, elderly widowed persons, etc., in order to plan facilities and services for these groups.

Spanish/Hispanic origin or descent? The identification of Spanish/Hispanic origin groups is important for a better understanding of cultural differences and for the carrying out of laws and programs aimed at improving the economic conditions of these groups.

Complete plumbing? This question gives information on the quality of housing. the data are used with other statistics to show how the "level of living" compares in various areas and how it has changed over time.

Value or rent? Government and planning agencies use this information in combination with other characteristics to develop housing pro grams designed to meet the needs of people at different economic levels.

INSTRUCTIONS FOR QUESTIONS 1 THROUGH 7

1. List in question 1 (on page 1), the names of all the people who usually live here. Then turn to pages 2 and 3 where there are columns to list up to seven persons. In the first column print the name of one of the household members in whose name this home is owned or rented. If no household member owns or rents the living quarters, list in the first column any adult household member who is not a roomer, boarder, or paid employee. Print the names of the other household members, if any, in the columns which follow, using question 1 as a checklist.

2. Fill a circle to show how each person is related to the person in column 1.

   A stepchild or legally adopted child of the person in column 1 should be marked **Son/daughter**. Foster children or wards living in the household should be marked **Roomer, boarder**.

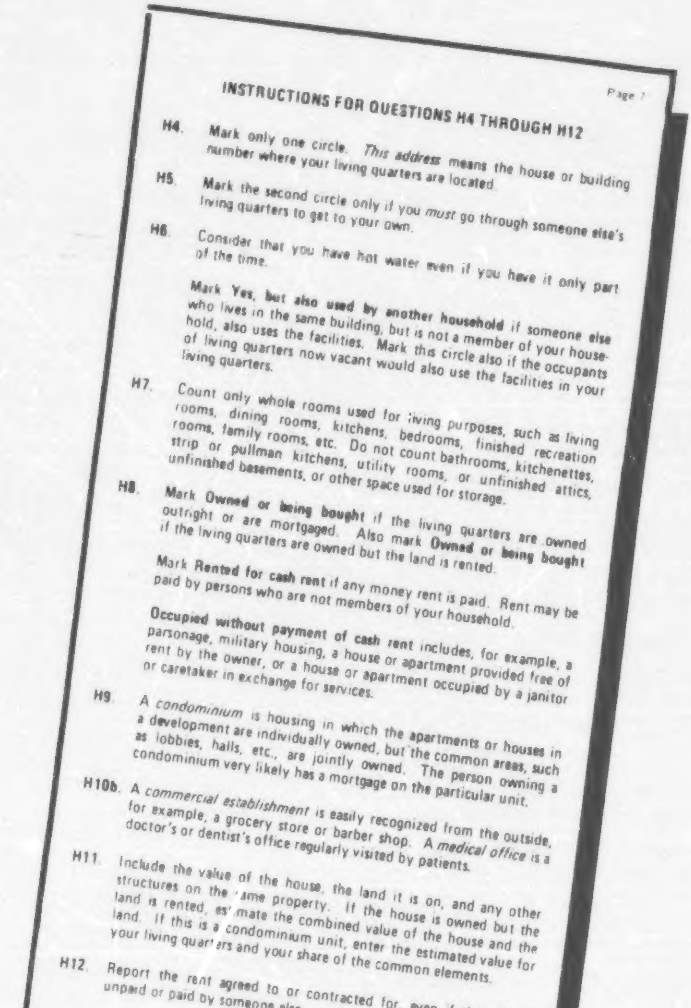
3. Be sure to fill a circle for the sex of each person.

4. Fill the circle for the category with which the person most closely identifies. If you fill the **Indian (American)** or **Other** circle, be sure to print the name of the specific Indian tribe or specific group.

5. Enter age at last birthday in the space provided (enter "0" for babies less than one year old). Also enter month and year of birth, *and* fill the appropriate circles. For an illustration of how to complete question 5, see the example on pages 4 and 5. If age or month or year of birth is [illegible] known, give your best estimate.

6. If the person's only marriage was annulled, mark **Never married**.

7. A person is of Spanish/Hispanic origin or descent if the person *identifies* his or her ancestry with one of the listed groups, that is, Mexican, Puerto Rican, etc. Origin or descent may be viewed as the nationality group, the lineage, or country in which the person or the person's parents or ancestors were born.



Page 7

INSTRUCTIONS FOR QUESTIONS H4 THROUGH H12

H4. Mark only one circle. *This address* means the house or building number where your living quarters are located.

H5. Mark the second circle only if you *must* go through someone else's living quarters to get to your own.

H6. Consider that you have hot water even if you have it only part of the time.

Mark **Yes, but also used by another household** if someone else who lives in the same building, but is not a member of your household, also uses the facilities. Mark this circle also if the occupants of living quarters now vacant would also use the facilities in your living quarters.

H7. Count only whole rooms used for living purposes, such as living rooms, dining rooms, kitchens, bedrooms, finished recreation rooms, family rooms, etc. Do not count bathrooms, kitchenettes, strip or pullman kitchens, utility rooms, or unfinished attics, unfinished basements, or other space used for storage.

H8. Mark **Owned or being bought** if the living quarters are owned outright or are mortgaged. Also mark **Owned or being bought** if the living quarters are owned but the land is rented.

Mark **Rented for cash rent** if any money rent is paid. Rent may be paid by persons who are not members of your household.

Occupied without payment of cash rent includes, for example, a parsonage, military housing, a house or apartment provided free of rent by the owner, or a house or apartment occupied by a janitor or caretaker in exchange for services.

H9. A *condominium* is housing in which the apartments or houses in a development are individually owned, but the common areas, such as lobbies, halls, etc., are jointly owned. The person owning a condominium very likely has a mortgage on the particular unit.

H10b. A *commercial establishment* is easily recognized from the outside, for example, a grocery store or barber shop. A *medical office* is a doctor's or dentist's office regularly visited by patients.

H11. Include the value of the house, the land it is on, and any other structures on the same property. If the house is owned but the land is rented, estimate the combined value of the house and the land. If this is a condominium unit, enter the estimated value for your living quarters and your share of the common elements.

H12. Report the rent agreed to or contracted for, even if the rent is unpaid or paid by someone else.

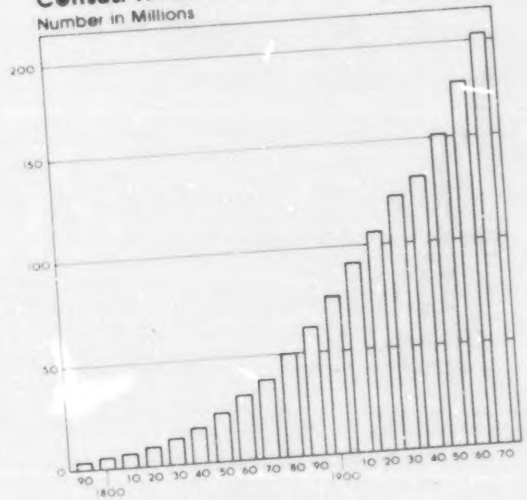
If rent is not paid by the month, change the rent to a monthly amount, and then fill the appropriate circle in question H12.

If rent is paid	Multiply rent by
By the day	30
By the week	4
Every other week	2

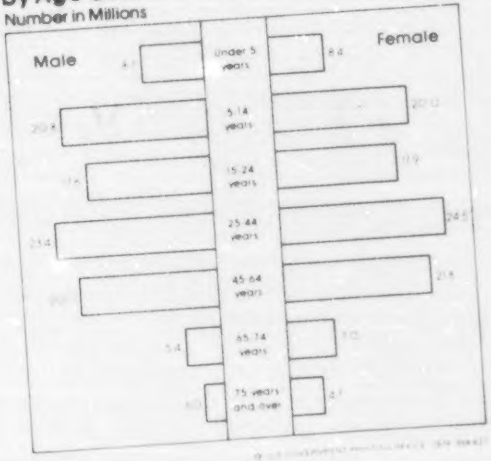
If rent is paid	Divide rent by
4 times a year	3
2 times a year	6
Once a year	12

Population of the United States

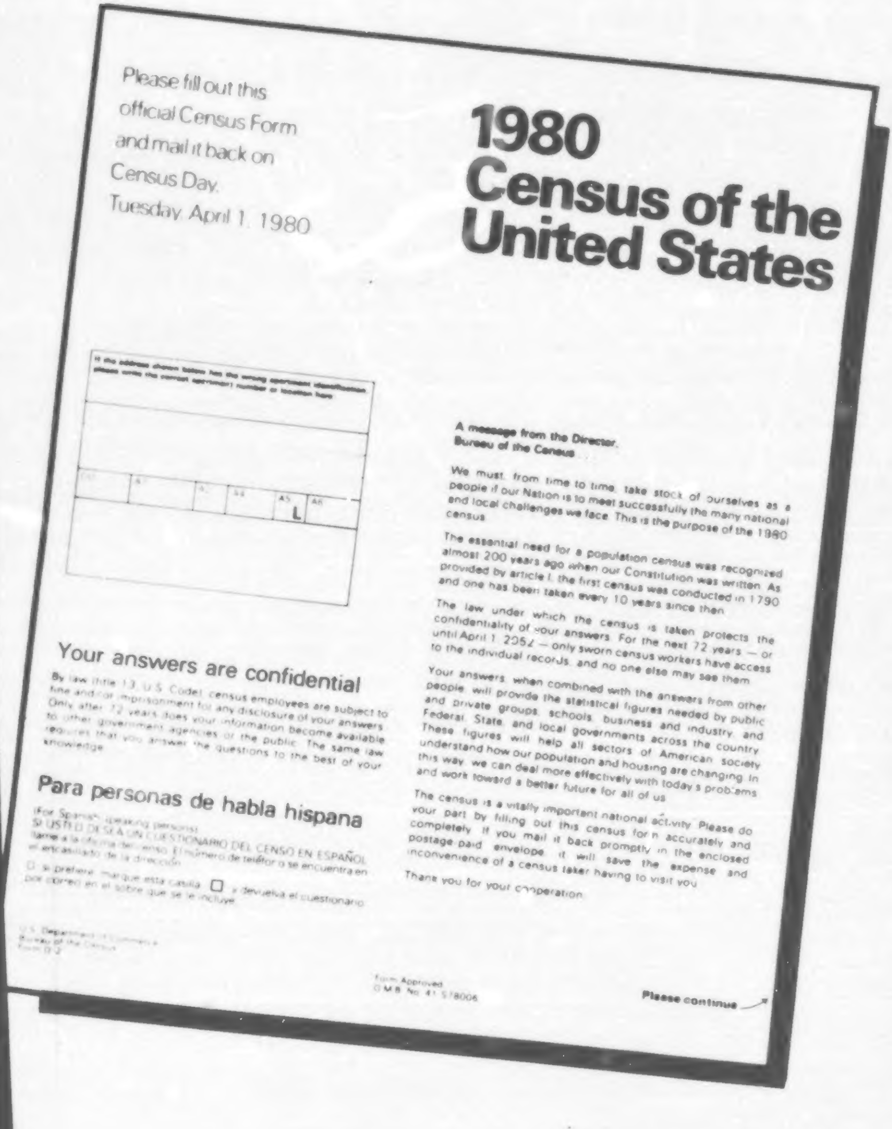
Total Number of Persons in Each Census: 1790-1970



Number of Persons by Age and Sex: 1970



APPENDIX G



Please fill out this
official Census Form
and mail it back on
Census Day,
Tuesday, April 1, 1980

1980
Census of the
United States

If the address shown below has the wrong apartment identification, please write the correct apartment number or location here

A4 A5 L A6

Your answers are confidential

By law (title 13, U.S. Code), census employees are subject to fine and/or imprisonment for any disclosure of your answers. Only after 72 years does your information become available to other government agencies or the public. The same law requires that you answer the questions to the best of your knowledge.

Para personas de habla hispana

(For Spanish speaking persons)
SI USTED DESEA UN CUESTIONARIO DEL CENSO EN ESPAÑOL
llame a la oficina del censo. El número de teléfono se encuentra en
el encasillado de la dirección.
☐ si prefiere, marque esta casilla ☐ y devuelva el cuestionario
por correo en el sobre que se le incluye.

U.S. Department of Commerce
Bureau of the Census
Form D-2

A message from the Director,
Bureau of the Census . . .

We must, from time to time, take stock of ourselves as a people if our Nation is to meet successfully the many national and local challenges we face. This is the purpose of the 1980 census.

The essential need for a population census was recognized almost 200 years ago when our Constitution was written. As provided by article I, the first census was conducted in 1790 and one has been taken every 10 years since then.

The law under which the census is taken protects the confidentiality of your answers. For the next 72 years — or until April 1, 2052 — only sworn census workers have access to the individual records, and no one else may see them.

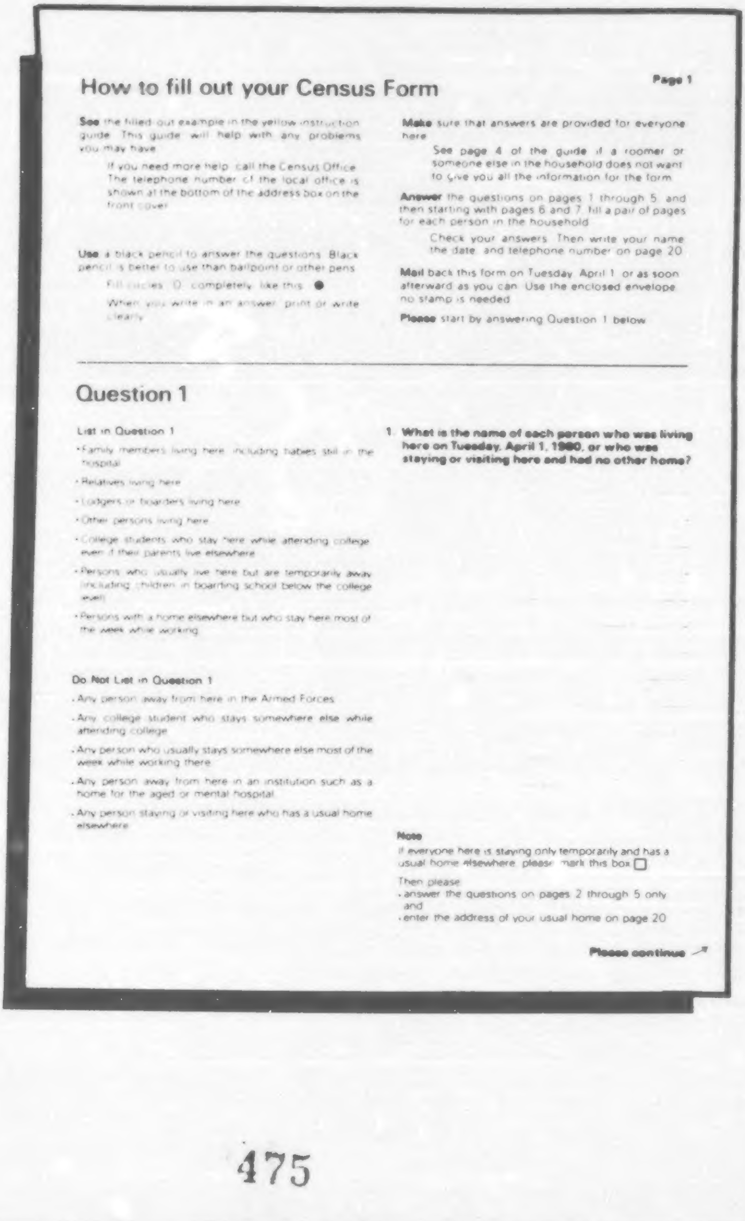
Your answers, when combined with the answers from other people, will provide the statistical figures needed by public and private groups, schools, business and industry, and Federal, State, and local governments across the country. These figures will help all sectors of American society understand how our population and housing are changing. In this way, we can deal more effectively with today's problems and work toward a better future for all of us.

The census is a vitally important national activity. Please do your part by filling out this census form accurately and completely. If you mail it back promptly in the enclosed postage-paid envelope, it will save the expense and inconvenience of a census taker having to visit you.

Thank you for your cooperation.

Form Approved
O.M.B. No. 41-S78006

Please continue →



Page 1

How to fill out your Census Form

See the filled-out example in the yellow instruction guide. This guide will help with any problems you may have.

If you need more help, call the Census Office. The telephone number of the local office is shown at the bottom of the address box on the front cover.

Use a black pencil to answer the questions. Black pencil is better to use than ballpoint or other pens.

Fill circles ○ completely, like this: ●

When you write in an answer, print or write clearly.

Make sure that answers are provided for everyone here.

See page 4 of the guide if a roomer or someone else in the household does not want to give you all the information for the form.

Answer the questions on pages 1 through 5, and then starting with pages 6 and 7, fill a pair of pages for each person in the household.

Check your answers. Then write your name, the date, and telephone number on page 20.

Mail back this form on Tuesday, April 1, or as soon afterward as you can. Use the enclosed envelope; no stamp is needed.

Please start by answering Question 1 below.

Question 1

List in Question 1

- Family members living here, including babies still in the hospital
- Relatives living here
- Lodgers or boarders living here
- Other persons living here
- College students who stay here while attending college, even if their parents live elsewhere
- Persons who usually live here but are temporarily away (including children in boarding school below the college level)
- Persons with a home elsewhere but who stay here most of the week while working

Do Not List in Question 1

- Any person away from here in the Armed Forces
- Any college student who stays somewhere else while attending college
- Any person who usually stays somewhere else most of the week while working there
- Any person away from here in an institution such as a home for the aged or mental hospital
- Any person staying or visiting here who has a usual home elsewhere

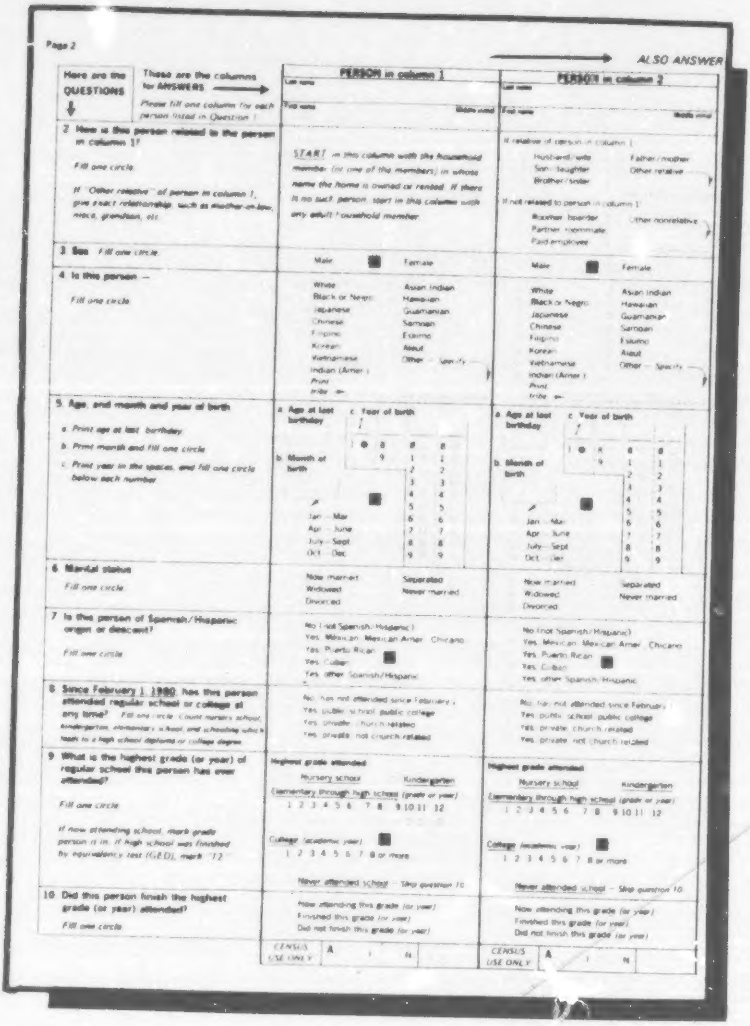
1. **What is the name of each person who was living here on Tuesday, April 1, 1980, or who was staying or visiting here and had no other home?**

Note

If everyone here is staying only temporarily and has a usual home elsewhere, please mark this box ☐

Then please
- answer the questions on pages 2 through 5 only and
- enter the address of your usual home on page 20

Please continue ↗



Page 2

→ ALSO ANSWER

Here are the QUESTIONS ↓ **These are the columns for ANSWERS** → *Please fill one column for each person listed in Question 1*	**PERSON in column 1** Last name First name Middle initial	**PERSON in column 2** Last name First name Middle initial
2. How is this person related to the person in column 1? *Fill one circle.* *If "Other relative" of person in column 1, give exact relationship, such as mother-in-law, niece, grandson, etc.*	*START in this column with the household member (or one of the members) in whose name the home is owned or rented. If there is no such person, start in this column with any adult household member.*	If relative of person in column 1: Husband/wife Son/daughter Brother/sister Father/mother Other relative If not related to person in column 1: Roomer, boarder Partner, roommate Paid employee Other nonrelative
3. Sex *Fill one circle.*	Male Female	Male Female
4. Is this person — *Fill one circle.*	White Black or Negro Japanese Chinese Filipino Korean Vietnamese Indian (Amer.) *Print tribe* → Asian Indian Hawaiian Guamanian Samoan Eskimo Aleut Other — *Specify*	White Black or Negro Japanese Chinese Filipino Korean Vietnamese Indian (Amer.) *Print tribe* → Asian Indian Hawaiian Guamanian Samoan Eskimo Aleut Other — *Specify*
5. Age, and month and year of birth *a. Print age at last birthday.* *b. Print month and fill one circle.* *c. Print year in the spaces, and fill one circle below each number.*	**a. Age at last birthday** **b. Month of birth** Jan.—Mar. Apr.—June July—Sept. Oct.—Dec. **c. Year of birth** 1 ● 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9	**a. Age at last birthday** **b. Month of birth** Jan.—Mar. Apr.—June July—Sept. Oct.—Dec. **c. Year of birth** 1 ● 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9
6. Marital status *Fill one circle.*	Now married Widowed Divorced Separated Never married	Now married Widowed Divorced Separated Never married
7. Is this person of Spanish/Hispanic origin or descent? *Fill one circle.*	No (not Spanish/Hispanic) Yes, Mexican, Mexican-Amer., Chicano Yes, Puerto Rican Yes, Cuban Yes, other Spanish/Hispanic	No (not Spanish/Hispanic) Yes, Mexican, Mexican-Amer., Chicano Yes, Puerto Rican Yes, Cuban Yes, other Spanish/Hispanic
8. Since February 1, 1980, has this person attended regular school or college at any time? *Fill one circle. Count nursery school, kindergarten, elementary school, and schooling which leads to a high school diploma or college degree.*	No, has not attended since February 1 Yes, public school, public college Yes, private, church related Yes, private, not church related	No, has not attended since February 1 Yes, public school, public college Yes, private, church related Yes, private, not church related
9. What is the highest grade (or year) of regular school this person has ever attended? *Fill one circle.* *If now attending school, mark grade person is in. If high school was finished by equivalency test (GED), mark "12."*	**Highest grade attended:** Nursery school Kindergarten Elementary through high school *(grade or year)* 1 2 3 4 5 6 7 8 9 10 11 12 College *(academic year)* 1 2 3 4 5 6 7 8 or more Never attended school — *Skip question 10*	**Highest grade attended:** Nursery school Kindergarten Elementary through high school *(grade or year)* 1 2 3 4 5 6 7 8 9 10 11 12 College *(academic year)* 1 2 3 4 5 6 7 8 or more Never attended school — *Skip question 10*
10. Did this person finish the highest grade (or year) attended? *Fill one circle.*	Now attending this grade *(or year)* Finished this grade *(or year)* Did not finish this grade *(or year)*	Now attending this grade *(or year)* Finished this grade *(or year)* Did not finish this grade *(or year)*
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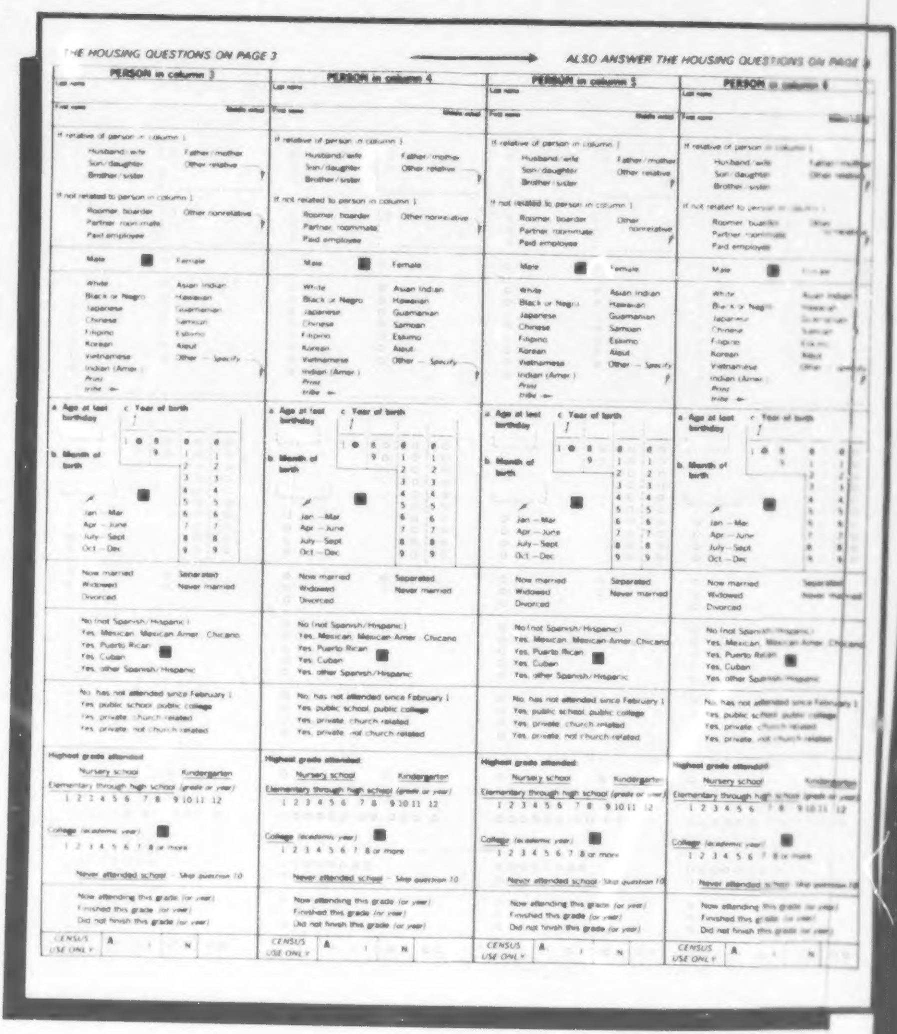

HE HOUSING QUESTIONS ON PAGE 3 → ALSO ANSWER THE HOUSING QUESTIONS ON PAGE 3

PERSON in column 3	PERSON in column 4	PERSON in column 5	PERSON in column 6
Last name First name Middle initial	Last name First name Middle initial	Last name First name Middle initial	Last name First name Middle initial
If relative of person in column 1: Husband/wife Father/mother Son/daughter Other relative Brother/sister If not related to person in column 1: Roomer, boarder Other nonrelative Partner, roommate Paid employee	If relative of person in column 1: Husband/wife Father/mother Son/daughter Other relative Brother/sister If not related to person in column 1: Roomer, boarder Other nonrelative Partner, roommate Paid employee	If relative of person in column 1: Husband/wife Father/mother Son/daughter Other relative Brother/sister If not related to person in column 1: Roomer, boarder Other nonrelative Partner, roommate Paid employee	If relative of person in column 1: Husband/wife Father/mother Son/daughter Other relative Brother/sister If not related to person in column 1: Roomer, boarder Other nonrelative Partner, roommate Paid employee
Male Female	Male Female	Male Female	Male Female
White Asian Indian Black or Negro Hawaiian Japanese Guamanian Chinese Samoan Filipino Eskimo Korean Aleut Vietnamese Other — Specify Indian (Amer.) *Print tribe* →	White Asian Indian Black or Negro Hawaiian Japanese Guamanian Chinese Samoan Filipino Eskimo Korean Aleut Vietnamese Other — Specify Indian (Amer.) *Print tribe* →	White Asian Indian Black or Negro Hawaiian Japanese Guamanian Chinese Samoan Filipino Eskimo Korean Aleut Vietnamese Other — Specify Indian (Amer.) *Print tribe* →	White Asian Indian Black or Negro Hawaiian Japanese Guamanian Chinese Samoan Filipino Eskimo Korean Aleut Vietnamese Other — Specify Indian (Amer.) *Print tribe* →
a. Age at last birthday **b. Month of birth** Jan.—Mar. Apr.—June July—Sept. Oct.—Dec. **c. Year of birth** 1 ● 8 0 0 9 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9	**a. Age at last birthday** **b. Month of birth** Jan.—Mar. Apr.—June July—Sept. Oct.—Dec. **c. Year of birth** 1 ● 8 0 0 9 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9	**a. Age at last birthday** **b. Month of birth** Jan.—Mar. Apr.—June July—Sept. Oct.—Dec. **c. Year of birth** 1 ● 8 0 0 9 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9	**a. Age at last birthday** **b. Month of birth** Jan.—Mar. Apr.—June July—Sept. Oct.—Dec. **c. Year of birth** 1 ● 8 0 0 9 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9
Now married Separated Widowed Never married Divorced	Now married Separated Widowed Never married Divorced	Now married Separated Widowed Never married Divorced	Now married Separated Widowed Never married Divorced
No (not Spanish/Hispanic) Yes, Mexican, Mexican-Amer., Chicano Yes, Puerto Rican Yes, Cuban Yes, other Spanish/Hispanic	No (not Spanish/Hispanic) Yes, Mexican, Mexican-Amer., Chicano Yes, Puerto Rican Yes, Cuban Yes, other Spanish/Hispanic	No (not Spanish/Hispanic) Yes, Mexican, Mexican-Amer., Chicano Yes, Puerto Rican Yes, Cuban Yes, other Spanish/Hispanic	No (not Spanish/Hispanic) Yes, Mexican, Mexican-Amer., Chicano Yes, Puerto Rican Yes, Cuban Yes, other Spanish/Hispanic
No, has not attended since February 1 Yes, public school, public college Yes, private, church related Yes, private, not church related	No, has not attended since February 1 Yes, public school, public college Yes, private, church related Yes, private, not church related	No, has not attended since February 1 Yes, public school, public college Yes, private, church related Yes, private, not church related	No, has not attended since February 1 Yes, public school, public college Yes, private, church related Yes, private, not church related
Highest grade attended: Nursery school Kindergarten Elementary through high school *(grade or year)* 1 2 3 4 5 6 7 8 9 10 11 12 College *(academic year)* 1 2 3 4 5 6 7 8 or more Never attended school — *Skip question 10*	**Highest grade attended:** Nursery school Kindergarten Elementary through high school *(grade or year)* 1 2 3 4 5 6 7 8 9 10 11 12 College *(academic year)* 1 2 3 4 5 6 7 8 or more Never attended school — *Skip question 10*	**Highest grade attended:** Nursery school Kindergarten Elementary through high school *(grade or year)* 1 2 3 4 5 6 7 8 9 10 11 12 College *(academic year)* 1 2 3 4 5 6 7 8 or more Never attended school — *Skip question 10*	**Highest grade attended:** Nursery school Kindergarten Elementary through high school *(grade or year)* 1 2 3 4 5 6 7 8 9 10 11 12 College *(academic year)* 1 2 3 4 5 6 7 8 or more Never attended school — *Skip question 10*
Now attending this grade *(or year)* Finished this grade *(or year)* Did not finish this grade *(or year)*	Now attending this grade *(or year)* Finished this grade *(or year)* Did not finish this grade *(or year)*	Now attending this grade *(or year)* Finished this grade *(or year)* Did not finish this grade *(or year)*	Now attending this grade *(or year)* Finished this grade *(or year)* Did not finish this grade *(or year)*
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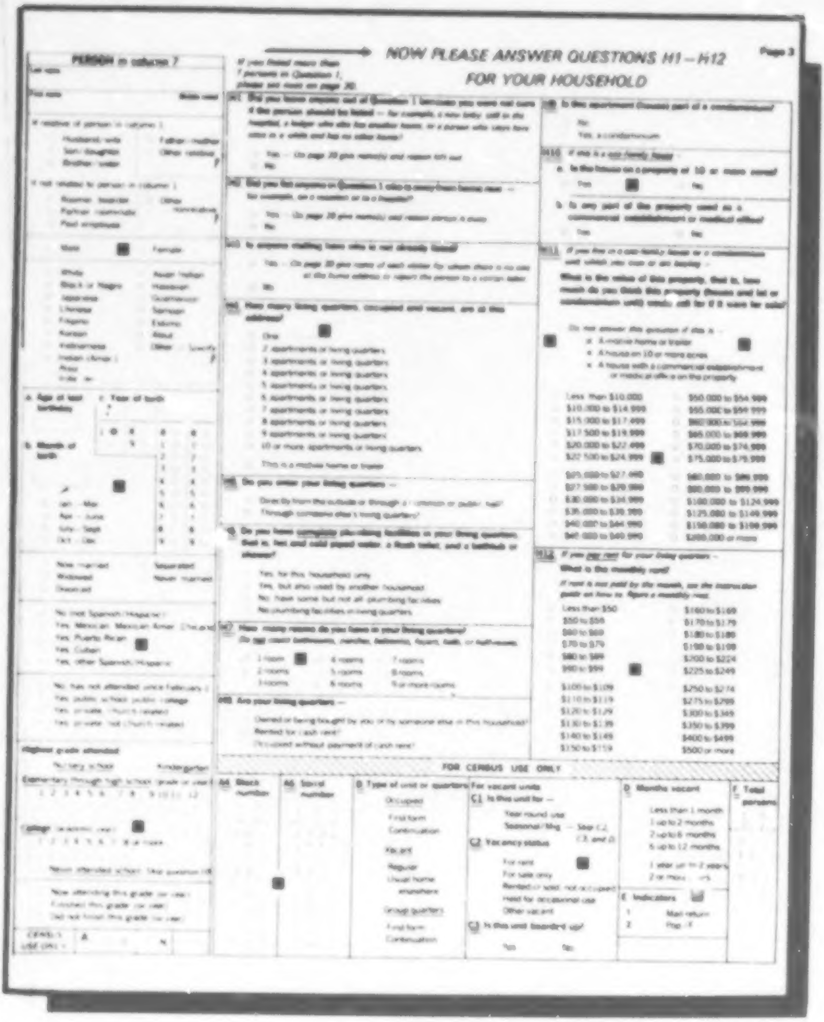
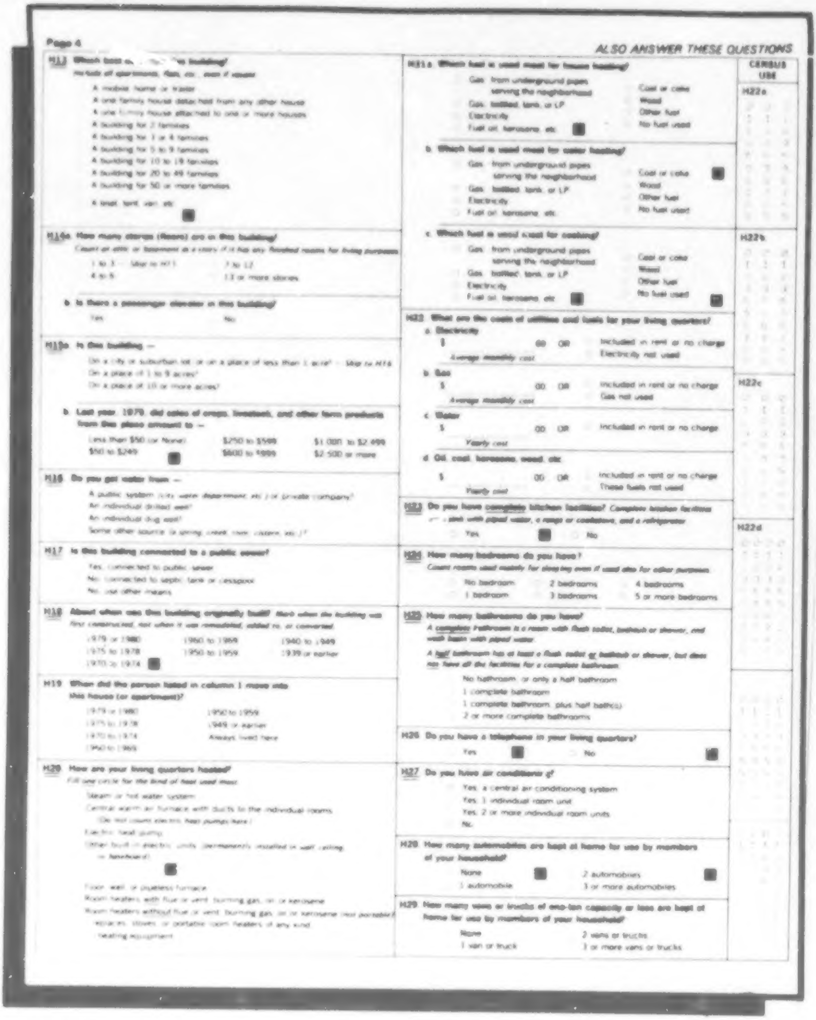


PERSON in column 7

NOW PLEASE ANSWER QUESTIONS H1 – H12
FOR YOUR HOUSEHOLD

Page 3

FOR CENSUS USE ONLY



Page 4

ALSO ANSWER THESE QUESTIONS

H13 Which best [illegible] this building?
Include all apartments, flats, etc., even if vacant.

A mobile home or trailer
A one-family house detached from any other house
A one-family house attached to one or more houses
A building for 2 families
A building for 3 or 4 families
A building for 5 to 9 families
A building for 10 to 19 families
A building for 20 to 49 families
A building for 50 or more families
A boat, tent, van, etc.

H14a. How many stories (floors) are in this building?
Count an attic or basement as a story if it has any finished rooms for living purposes.

1 to 3 — *Skip to H15*
4 to 6
7 to 12
13 or more stories

b. Is there a passenger elevator in this building?

Yes
No

H15a. Is this building —

On a city or suburban lot, or on a place of less than 1 acre? — *Skip to H16*
On a place of 1 to 9 acres?
On a place of 10 or more acres?

b. Last year, 1979, did sales of crops, livestock, and other farm products from this place amount to —

Less than $50 (or None)
$50 to $249
$250 to $599
$600 to $999
$1,000 to $2,499
$2,500 or more

H16. Do you get water from —

A public system (city water department, etc.) or private company?
An individual drilled well?
An individual dug well?
Some other source (a spring, creek, river, cistern, etc.)?

H17 Is this building connected to a public sewer?

Yes, connected to public sewer
No, connected to septic tank or cesspool
No, use other means

H18 About when was this building originally built? *Mark when the building was first constructed, not when it was remodeled, added to, or converted.*

1979 or 1980
1975 to 1978
1970 to 1974
1960 to 1969
1950 to 1959
1940 to 1949
1939 or earlier

H19 When did the person listed in column 1 move into this house (or apartment)?

1979 or 1980
1975 to 1978
1970 to 1974
1960 to 1969
1950 to 1959
1949 or earlier
Always lived here

H20 How are your living quarters heated?
Fill one circle for the kind of heat used most.

Steam or hot water system
Central warm-air furnace with ducts to the individual rooms
(Do not count electric heat pumps here.)
Electric heat pump
Other built-in electric units (permanently installed in wall, ceiling, or baseboard)
Floor, wall, or pipeless furnace
Room heaters with flue or vent, burning gas, oil, or kerosene
Room heaters without flue or vent, burning gas, oil, or kerosene (not portable)
Fireplaces, stoves, or portable room heaters of any kind
No heating equipment

H21a. Which fuel is used most for house heating?

Gas: from underground pipes serving the neighborhood
Gas: bottled, tank, or LP
Electricity
Fuel oil, kerosene, etc.
Coal or coke
Wood
Other fuel
No fuel used

b. Which fuel is used most for water heating?

Gas: from underground pipes serving the neighborhood
Gas: bottled, tank, or LP
Electricity
Fuel oil, kerosene, etc.
Coal or coke
Wood
Other fuel
No fuel used

c. Which fuel is used most for cooking?

Gas: from underground pipes serving the neighborhood
Gas: bottled, tank, or LP
Electricity
Fuel oil, kerosene, etc.
Coal or coke
Wood
Other fuel
No fuel used

H22 What are the costs of utilities and fuels for your living quarters?

a. Electricity
$ .00 OR Included in rent or no charge
Average monthly cost Electricity not used

b. Gas
$ .00 OR Included in rent or no charge
Average monthly cost Gas not used

c. Water
$ .00 OR Included in rent or no charge
Yearly cost

d. Oil, coal, kerosene, wood, etc.
$ .00 OR Included in rent or no charge
Yearly cost These fuels not used

H23 Do you have complete kitchen facilities? *Complete kitchen facilities are a sink with piped water, a range or cookstove, and a refrigerator.*

Yes
No

H24 How many bedrooms do you have?
Count rooms used mainly for sleeping even if used also for other purposes.

No bedroom
1 bedroom
2 bedrooms
3 bedrooms
4 bedrooms
5 or more bedrooms

H25 How many bathrooms do you have?
A complete bathroom is a room with flush toilet, bathtub or shower, and wash basin with piped water.

A half bathroom has at least a flush toilet or bathtub or shower, but does not have all the facilities for a complete bathroom.

No bathroom, or only a half bathroom
1 complete bathroom
1 complete bathroom, plus half bath(s)
2 or more complete bathrooms

H26 Do you have a telephone in your living quarters?

Yes
No

H27 Do you have air conditioning?

Yes, a central air-conditioning system
Yes, 1 individual room unit
Yes, 2 or more individual room units
No

H28 How many automobiles are kept at home for use by members of your household?

None
1 automobile
2 automobiles
3 or more automobiles

H29 How many vans or trucks of one-ton capacity or less are kept at home for use by members of your household?

None
1 van or truck
2 vans or trucks
3 or more vans or trucks

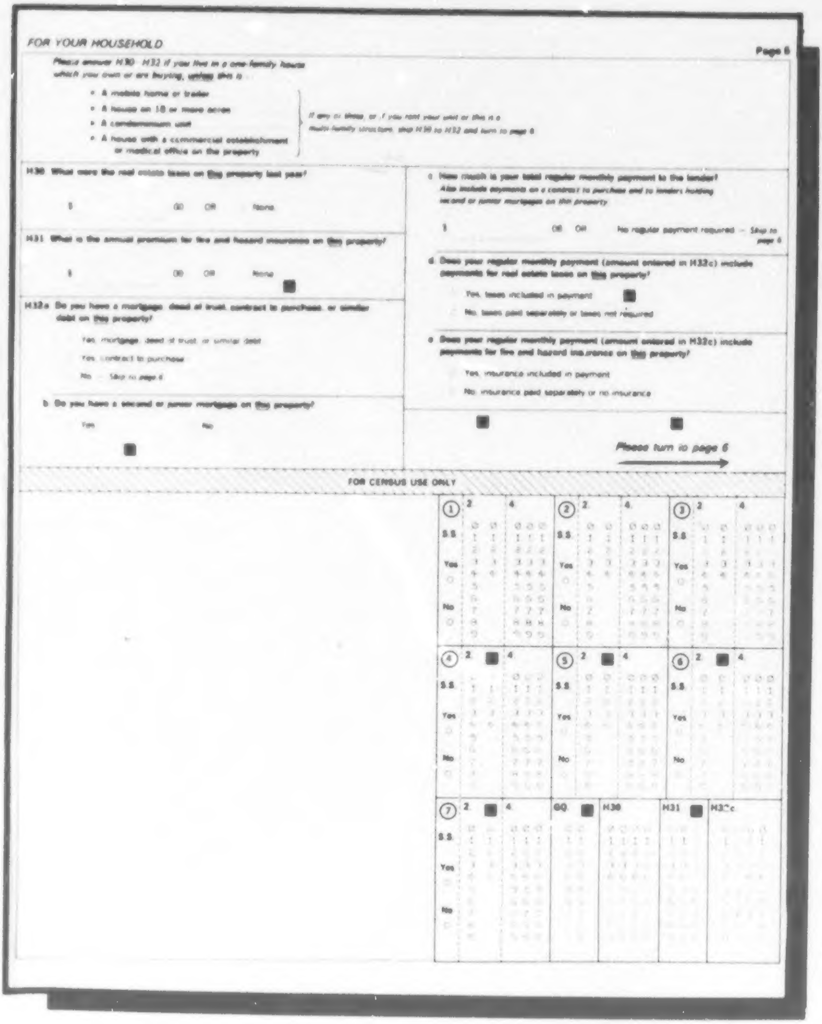
CENSUS USE

H22a

H22b

H22c

H22d



FOR YOUR HOUSEHOLD

Page 5

Please answer H30 - H32 if you live in a one-family house which you own or are buying, unless this is . . .

- *A mobile home or trailer*
- *A house on 10 or more acres*
- *A condominium unit*
- *A house with a commercial establishment or medical office on the property*

If any of these, or if you rent your unit or this is a multi-family structure, skip H30 to H32 and turn to page 6

H30. What were the real estate taxes on this property last year?

$ .00 OR None

H31. What is the annual premium for fire and hazard insurance on this property?

$ .00 OR None

H32a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on this property?

Yes, mortgage, deed of trust, or similar debt

Yes, contract to purchase

No — Skip to page 6

b. Do you have a second or junior mortgage on this property?

Yes No

c. How much is your total regular monthly payment to the lender?
Also include payments on a contract to purchase and to lenders holding second or junior mortgages on this property.

$ .00 OR No regular payment required — Skip to page 6

d. Does your regular monthly payment (amount entered in H32c) include payments for real estate taxes on this property?

Yes, taxes included in payment

No, taxes paid separately or taxes not required

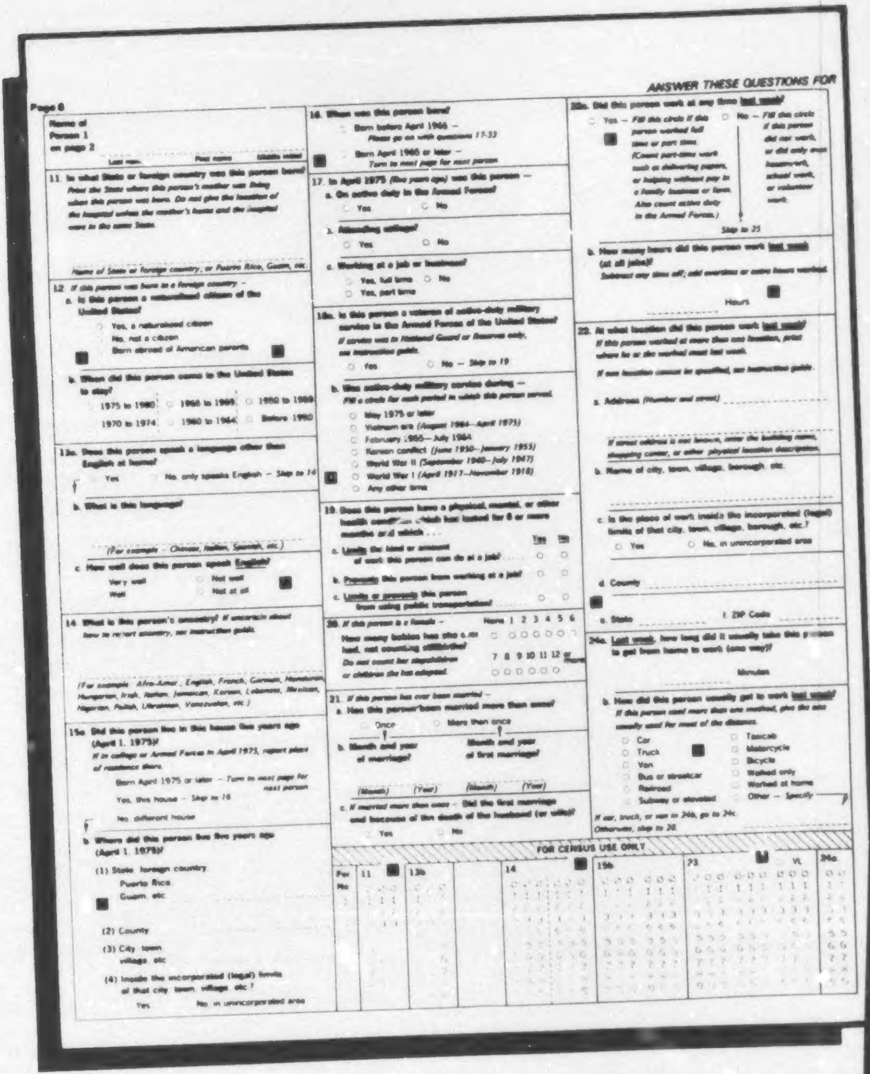
e. Does your regular monthly payment (amount entered in H32c) include payments for fire and hazard insurance on this property?

Yes, insurance included in payment

No, insurance paid separately or no insurance

Please turn to page 6 →

FOR CENSUS USE ONLY



ANSWER THESE QUESTIONS FOR

Page 6

Name of
Person 1
on page 2

Last name First name Middle initial

11. In what State or foreign country was this person born?
Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.

Name of State or foreign country, or Puerto Rico, Guam, etc.

12. *If this person was born in a foreign country –*
a. Is this person a naturalized citizen of the United States?
○ Yes, a naturalized citizen
No, not a citizen
Born abroad of American parents

b. When did this person come to the United States to stay?
○ 1975 to 1980 ○ 1965 to 1969 ○ 1950 to 1959
1970 to 1974 ○ 1960 to 1964 ○ Before 1950

13a. Does this person speak a language other than English at home?
Yes ○ No, only speaks English – *Skip to 14*

b. What is this language?

(For example – Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?
Very well ○ Not well
Well ○ Not at all

14. What is this person's ancestry? *If uncertain about how to report ancestry, see instruction guide.*

(For example: Afro-Amer., English, French, German, Honduran, Hungarian, Irish, Italian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Polish, Ukrainian, Venezuelan, etc.)

15a. Did this person live in this house five years ago (April 1, 1975)?
If in college or Armed Forces in April 1975, report place of residence there.
Born April 1975 or later – *Turn to next page for next person*
Yes, this house – *Skip to 16*
No, different house

b. Where did this person live five years ago (April 1, 1975)?
(1) State, foreign country, Puerto Rico, Guam, etc.
(2) County
(3) City, town, village, etc.
(4) Inside the incorporated (legal) limits of that city, town, village, etc.?
Yes No, in unincorporated area

16. When was this person born?
○ Born before April 1965 – *Please go on with questions 17-33*
○ Born April 1965 or later – *Turn to next page for next person*

17. In April 1975 *(five years ago)* was this person –
a. On active duty in the Armed Forces?
○ Yes ○ No

b. Attending college?
○ Yes ○ No

c. Working at a job or business?
○ Yes, full time ○ No
○ Yes, part time

18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?
If service was in National Guard or Reserves only, see instruction guide.
○ Yes ○ No – *Skip to 19*

b. Was active-duty military service during –
Fill a circle for each period in which this person served.
○ May 1975 or later
○ Vietnam era *(August 1964–April 1975)*
○ February 1955–July 1964
○ Korean conflict *(June 1950–January 1955)*
○ World War II *(September 1940–July 1947)*
○ World War I *(April 1917–November 1918)*
○ Any other time

19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .

	Yes	No
a. Limits the kind or amount of work this person can do at a job?	○	○
b. Prevents this person from working at a job?	○	○
c. Limits or prevents this person from using public transportation?	○	○

20. *If this person is a female –*
How many babies has she ever had, not counting stillbirths?
Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6
○	○	○	○	○	○	○
7	8	9	10	11	12 or more	
○	○	○	○	○	○	

21. *If this person has ever been married –*
a. Has this person been married more than once?
○ Once ○ More than once

b. Month and year of marriage? Month and year of first marriage?
(Month) (Year) (Month) (Year)

c. *If married more than once –* Did the first marriage end because of the death of the husband (or wife)?
○ Yes ○ No

22a. Did this person work at any time last week?
○ Yes – *Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)*
○ No – *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.* *Skip to 25*

b. How many hours did this person work last week (at all jobs)?
Subtract any time off; add overtime or extra hours worked.
Hours

23. At what location did this person work last week?
If this person worked at more than one location, print where he or she worked most last week.
If one location cannot be specified, see instruction guide.

a. Address *(Number and street)*

If street address is not known, enter the building name, shopping center, or other physical location description.

b. Name of city, town, village, borough, etc.

c. Is the place of work inside the incorporated (legal) limits of that city, town, village, borough, etc.?
○ Yes ○ No, in unincorporated area

d. County

e. State f. ZIP Code

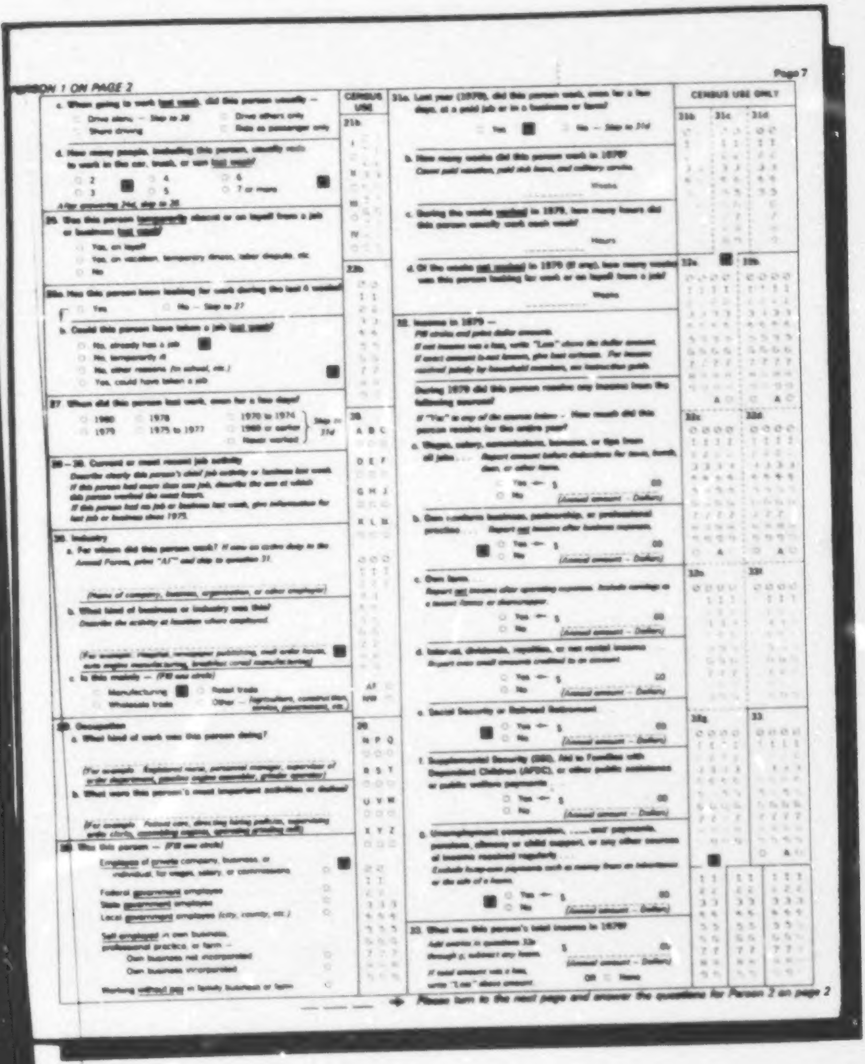
24a. Last week, how long did it usually take this person to get from home to work (one way)?
Minutes

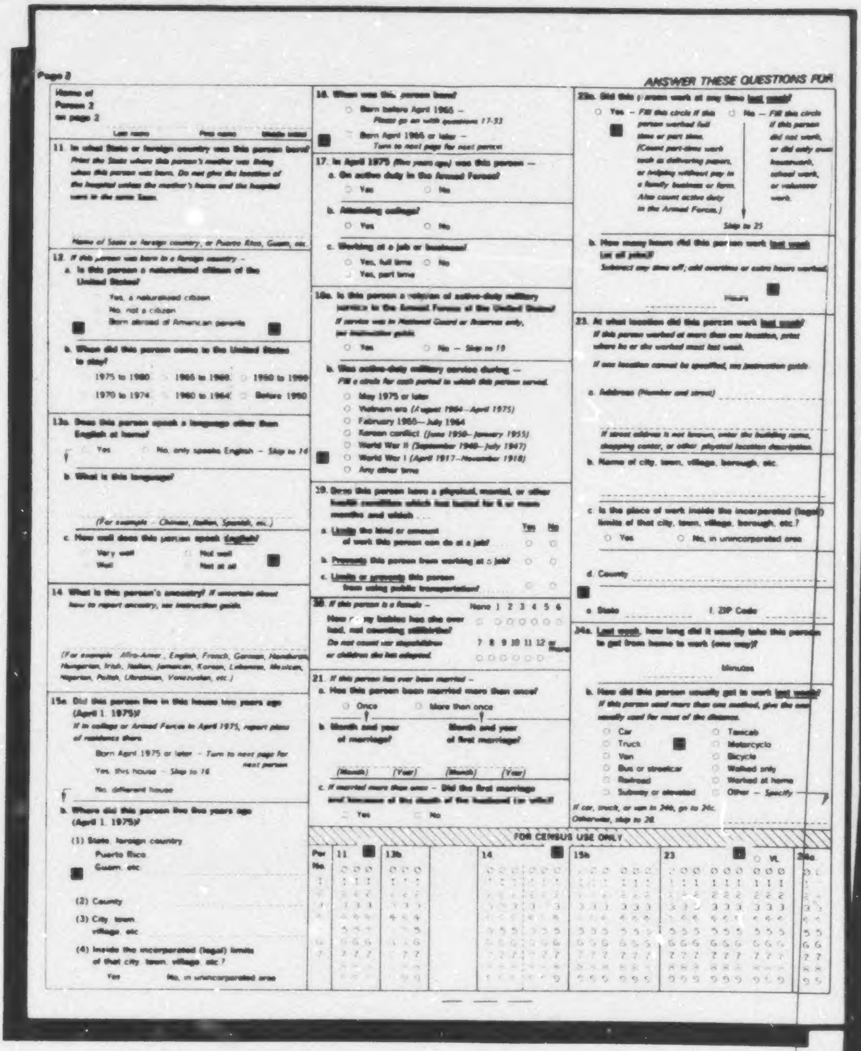
b. How did this person usually get to work last week?
If this person used more than one method, give the one usually used for most of the distance.
○ Car ○ Taxicab
○ Truck ○ Motorcycle
○ Van ○ Bicycle
○ Bus or streetcar ○ Walked only
○ Railroad ○ Worked at home
○ Subway or elevated ○ Other – *Specify*

If car, truck, or van in 24b, go to 24c. Otherwise, skip to 28.

FOR CENSUS USE ONLY

Per No 11 13b 14 15b 23 VL 24a





Page 3

ANSWER THESE QUESTIONS FOR

Name of Person 2 on page 2

Last name First name Middle initial

11. In what State or foreign country was this person born?
Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.

Name of State or foreign country, or Puerto Rico, Guam, etc.

12. *If this person was born in a foreign country —*
a. Is this person a naturalized citizen of the United States?
○ Yes, a naturalized citizen
○ No, not a citizen
○ Born abroad of American parents

b. When did this person come to the United States to stay?
○ 1975 to 1980 ○ 1965 to 1969 ○ 1950 to 1959
○ 1970 to 1974 ○ 1960 to 1964 ○ Before 1950

13a. Does this person speak a language other than English at home?
○ Yes ○ No, only speaks English — *Skip to 14*

b. What is this language?

(For example — Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?
○ Very well ○ Not well
○ Well ○ Not at all

14. What is this person's ancestry? *If uncertain about how to report ancestry, see instruction guide.*

(For example: Afro-Amer., English, French, German, Honduran, Hungarian, Irish, Italian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Polish, Ukrainian, Venezuelan, etc.)

15a. Did this person live in this house five years ago (April 1, 1975)?
If in college or Armed Forces in April 1975, report place of residence there.
○ Born April 1975 or later — *Turn to next page for next person*
○ Yes, this house — *Skip to 16*
○ No, different house

b. Where did this person live five years ago (April 1, 1975)?
(1) State, foreign country, Puerto Rico, Guam, etc.
(2) County
(3) City, town, village, etc.
(4) Inside the incorporated (legal) limits of that city, town, village, etc.?
○ Yes ○ No, in unincorporated area

16. When was this person born?
○ Born before April 1965 — *Please go on with questions 17-33*
○ Born April 1965 or later — *Turn to next page for next person*

17. In April 1975 (five years ago) was this person —
a. On active duty in the Armed Forces?
○ Yes ○ No
b. Attending college?
○ Yes ○ No
c. Working at a job or business?
○ Yes, full time ○ No
○ Yes, part time

18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?
If service was in National Guard or Reserves only, see instruction guide.
○ Yes ○ No — *Skip to 19*

b. Was active-duty military service during —
Fill a circle for each period in which this person served.
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○ February 1955—July 1964
○ Korean conflict *(June 1950—January 1955)*
○ World War II *(September 1940—July 1947)*
○ World War I *(April 1917—November 1918)*
○ Any other time

19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .

	Yes	No
a. Limits the kind or amount of work this person can do at a job?	○	○
b. Prevents this person from working at a job?	○	○
c. Limits or prevents this person from using public transportation?	○	○

20. *If this person is a female —*
How many babies has she ever had, not counting stillbirths?
Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6
○	○	○	○	○	○	○
7	8	9	10	11	12 or more	
○	○	○	○	○	○	

21. *If this person has ever been married —*
a. Has this person been married more than once?
○ Once ○ More than once
b. Month and year of marriage? Month and year of first marriage?
(Month) (Year) (Month) (Year)
c. *If married more than once —* Did the first marriage end because of the death of the husband (or wife)?
○ Yes ○ No

22a. Did this person work at any time last week?
○ Yes — *Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)*
○ No — *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.* — *Skip to 25*

b. How many hours did this person work last week (at all jobs)?
Subtract any time off; add overtime or extra hours worked.

Hours

23. At what location did this person work last week?
If this person worked at more than one location, print where he or she worked most last week.
If one location cannot be specified, see instruction guide.
a. Address (Number and street)
If street address is not known, enter the building name, shopping center, or other physical location description.
b. Name of city, town, village, borough, etc.
c. Is the place of work inside the incorporated (legal) limits of that city, town, village, borough, etc.?
○ Yes ○ No, in unincorporated area
d. County
e. State f. ZIP Code

24a. Last week, how long did it usually take this person to get from home to work (one way)?

Minutes

b. How did this person usually get to work last week?
If this person used more than one method, give the one usually used for most of the distance.
○ Car ○ Taxicab
○ Truck ○ Motorcycle
○ Van ○ Bicycle
○ Bus or streetcar ○ Walked only
○ Railroad ○ Worked at home
○ Subway or elevated ○ Other — *Specify*

If car, truck, or van in 24b, go to 24c. Otherwise, skip to 28.

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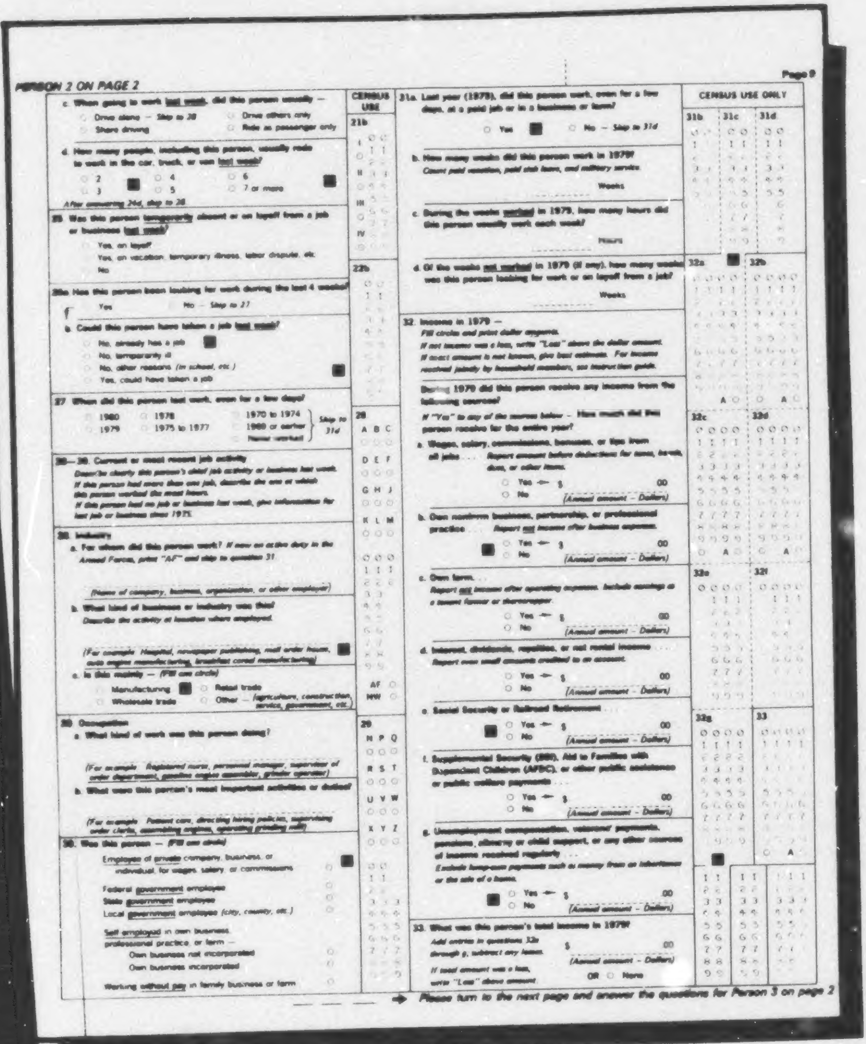
Per No.	11	13b		14	15b	23	○ VL	24a



PERSON 2 ON PAGE 2

Page 9

c. When going to work last week, did this person usually —
○ Drive alone — Skip to 28
○ Share driving
○ Drive others only
○ Ride as passenger only

d. How many people, including this person, usually rode to work in the car, truck, or van last week?
○ 2
○ 3
○ 4
○ 5
○ 6
○ 7 or more
After answering 24d, skip to 28.

25. Was this person temporarily absent or on layoff from a job or business last week?
○ Yes, on layoff
○ Yes, on vacation, temporary illness, labor dispute, etc.
○ No

26a. Has this person been looking for work during the last 4 weeks?
○ Yes
○ No — Skip to 27

b. Could this person have taken a job last week?
○ No, already has a job
○ No, temporarily ill
○ No, other reasons (in school, etc.)
○ Yes, could have taken a job

27. When did this person last work, even for a few days?
○ 1980
○ 1979
○ 1978
○ 1975 to 1977
○ 1970 to 1974
○ 1969 or earlier
○ Never worked
} Skip to 31d

28–30. Current or most recent job activity
Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give information for last job or business since 1975.

28. Industry
a. For whom did this person work? If now on active duty in the Armed Forces, print "AF" and skip to question 31.
(Name of company, business, organization, or other employer)

b. What kind of business or industry was this? Describe the activity at location where employed.
(For example: Hospital, newspaper publishing, mail order house, auto engine manufacturing, breakfast cereal manufacturing)

c. Is this mainly — (Fill one circle)
○ Manufacturing
○ Wholesale trade
○ Retail trade
○ Other — (agriculture, construction, service, government, etc.)

29. Occupation
a. What kind of work was this person doing?
(For example: Registered nurse, personnel manager, supervisor of order department, gasoline engine assembler, grinder operator)

b. What were this person's most important activities or duties?
(For example: Patient care, directing hiring policies, supervising order clerks, assembling engines, operating grinding mill)

30. Was this person — (Fill one circle)
Employee of private company, business, or individual, for wages, salary, or commissions ○
Federal government employee ○
State government employee ○
Local government employee (city, county, etc.) ○
Self-employed in own business, professional practice, or farm —
Own business not incorporated ○
Own business incorporated ○
Working without pay in family business or farm ○

CENSUS USE

31a. Last year (1979), did this person work, even for a few days, at a paid job or in a business or farm?
○ Yes
○ No — Skip to 31d

b. How many weeks did this person work in 1979? Count paid vacation, paid sick leave, and military service.
Weeks

c. During the weeks worked in 1979, how many hours did this person usually work each week?
Hours

d. Of the weeks not worked in 1979 (if any), how many weeks was this person looking for work or on layoff from a job?
Weeks

32. Income in 1979 —
Fill circles and print dollar amounts.
If net income was a loss, write "Loss" above the dollar amount.
If exact amount is not known, give best estimate. For income received jointly by household members, see instruction guide.

During 1979 did this person receive any income from the following sources?
If "Yes" to any of the sources below — How much did this person receive for the entire year?

a. Wages, salary, commissions, bonuses, or tips from all jobs . . . Report amount before deductions for taxes, bonds, dues, or other items.
○ Yes → $ .00
○ No (Annual amount — Dollars)

b. Own nonfarm business, partnership, or professional practice . . . Report net income after business expenses.
○ Yes → $ .00
○ No (Annual amount — Dollars)

c. Own farm . . .
Report net income after operating expenses. Include earnings as a tenant farmer or sharecropper.
○ Yes → $ .00
○ No (Annual amount — Dollars)

d. Interest, dividends, royalties, or net rental income . . .
Report even small amounts credited to an account.
○ Yes → $ .00
○ No (Annual amount — Dollars)

e. Social Security or Railroad Retirement . . .
○ Yes → $ .00
○ No (Annual amount — Dollars)

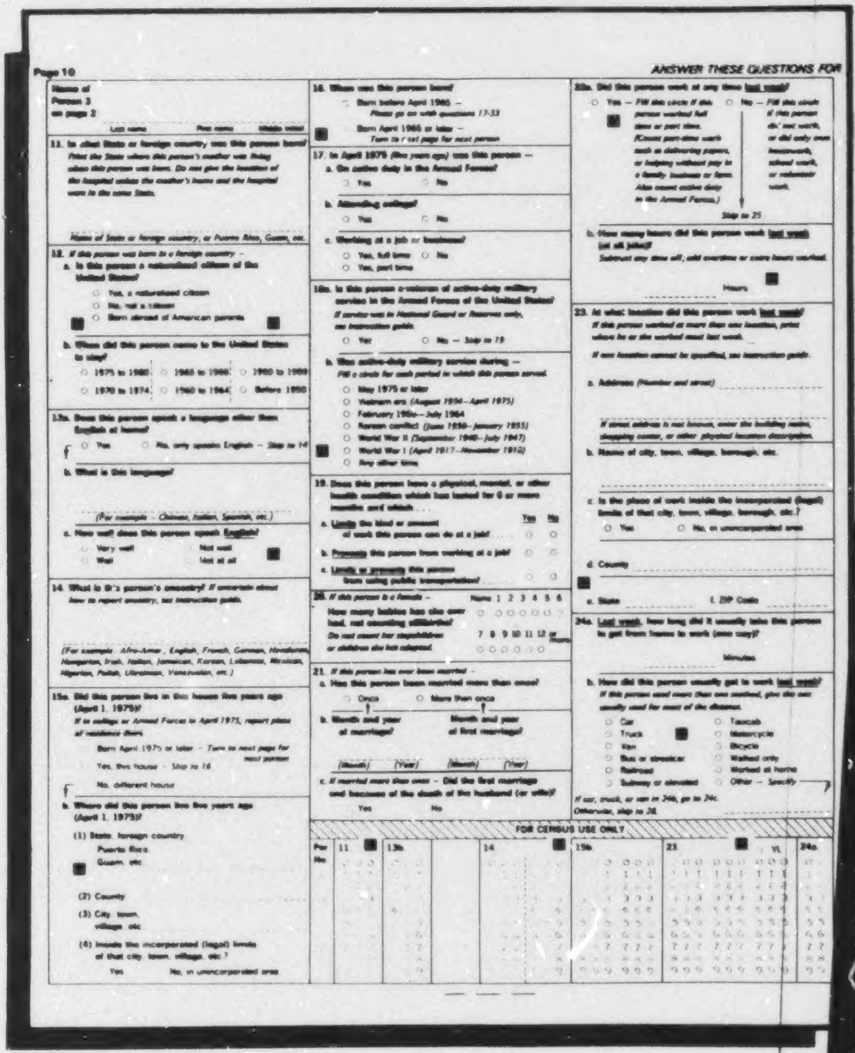
f. Supplemental Security (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments . . .
○ Yes → $ .00
○ No (Annual amount — Dollars)

g. Unemployment compensation, veterans' payments, pensions, alimony or child support, or any other sources of income received regularly . . .
Exclude lump-sum payments such as money from an inheritance or the sale of a home.
○ Yes → $ .00
○ No (Annual amount — Dollars)

33. What was this person's total income in 1979?
Add entries in questions 32a through g; subtract any losses.
$ .00
(Annual amount — Dollars)
If total amount was a loss, write "Loss" above amount.
OR ○ None

CENSUS USE ONLY
31b 31c 31d 32a 32b 32c 32d 32e 32f 32g 33

→ Please turn to the next page and answer the questions for Person 3 on page 2



Page 10

ANSWER THESE QUESTIONS FOR

Name of Person 3 on page 2

Last name First name Middle initial

11. In what State or foreign country was this person born?
Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.

Name of State or foreign country, or Puerto Rico, Guam, etc.

12. *If this person was born in a foreign country –*
a. Is this person a naturalized citizen of the United States?
○ Yes, a naturalized citizen
○ No, not a citizen
○ Born abroad of American parents

b. When did this person come to the United States to stay?
○ 1975 to 1980 ○ 1965 to 1969 ○ 1950 to 1959
○ 1970 to 1974 ○ 1960 to 1964 ○ Before 1950

13a. Does this person speak a language other than English at home?
○ Yes ○ No, only speaks English – *Skip to 14*

b. What is this language?

(For example – Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?
○ Very well ○ Not well
○ Well ○ Not at all

14. What is this person's ancestry? *If uncertain about how to report ancestry, see instruction guide.*

(For example: Afro-Amer., English, French, German, Honduran, Hungarian, Irish, Italian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Polish, Ukrainian, Venezuelan, etc.)

15a. Did this person live in this house five years ago (April 1, 1975)?
If in college or Armed Forces in April 1975, report place of residence there.
Born April 1975 or later – *Turn to next page for next person*
Yes, this house – *Skip to 16*
No, different house

b. Where did this person live five years ago (April 1, 1975)?
(1) State, foreign country, Puerto Rico, Guam, etc.
(2) County
(3) City, town, village, etc.
(4) Inside the incorporated (legal) limits of that city, town, village, etc.?
Yes No, in unincorporated area

16. When was this person born?
○ Born before April 1965 – *Please go on with questions 17-33*
○ Born April 1965 or later – *Turn to next page for next person*

17. In April 1975 (five years ago) was this person –
a. On active duty in the Armed Forces?
○ Yes ○ No
b. Attending college?
○ Yes ○ No
c. Working at a job or business?
○ Yes, full time ○ No
○ Yes, part time

18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?
If service was in National Guard or Reserves only, see instruction guide.
○ Yes ○ No – *Skip to 19*

b. Was active-duty military service during –
Fill a circle for each period in which this person served.
○ May 1975 or later
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○ Korean conflict *(June 1950–January 1955)*
○ World War II *(September 1940–July 1947)*
○ World War I *(April 1917–November 1918)*
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19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .

	Yes	No
a. Limits the kind or amount of work this person can do at a job?	○	○
b. Prevents this person from working at a job?	○	○
c. Limits or prevents this person from using public transportation?	○	○

20. *If this person is a female –*
How many babies has she ever had, not counting stillbirths?
Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6
○	○	○	○	○	○	○
7	8	9	10	11	12 or more	
○	○	○	○	○	○	

21. *If this person has ever been married –*
a. Has this person been married more than once?
○ Once ○ More than once
b. Month and year of marriage? **Month and year of first marriage?**
(Month) (Year) (Month) (Year)
c. *If married more than once –* **Did the first marriage end because of the death of the husband (or wife)?**
Yes No

22a. Did this person work at any time last week?
○ Yes – *Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)*
○ No – *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.* *Skip to 25*

b. How many hours did this person work last week (at all jobs)?
Subtract any time off; add overtime or extra hours worked.
Hours

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○ Yes ○ No, in unincorporated area
d. County
e. State **f. ZIP Code**

24a. Last week, how long did it usually take this person to get from home to work (one way)?
Minutes

b. How did this person usually get to work last week?
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○ Subway or elevated ○ Other – *Specify*
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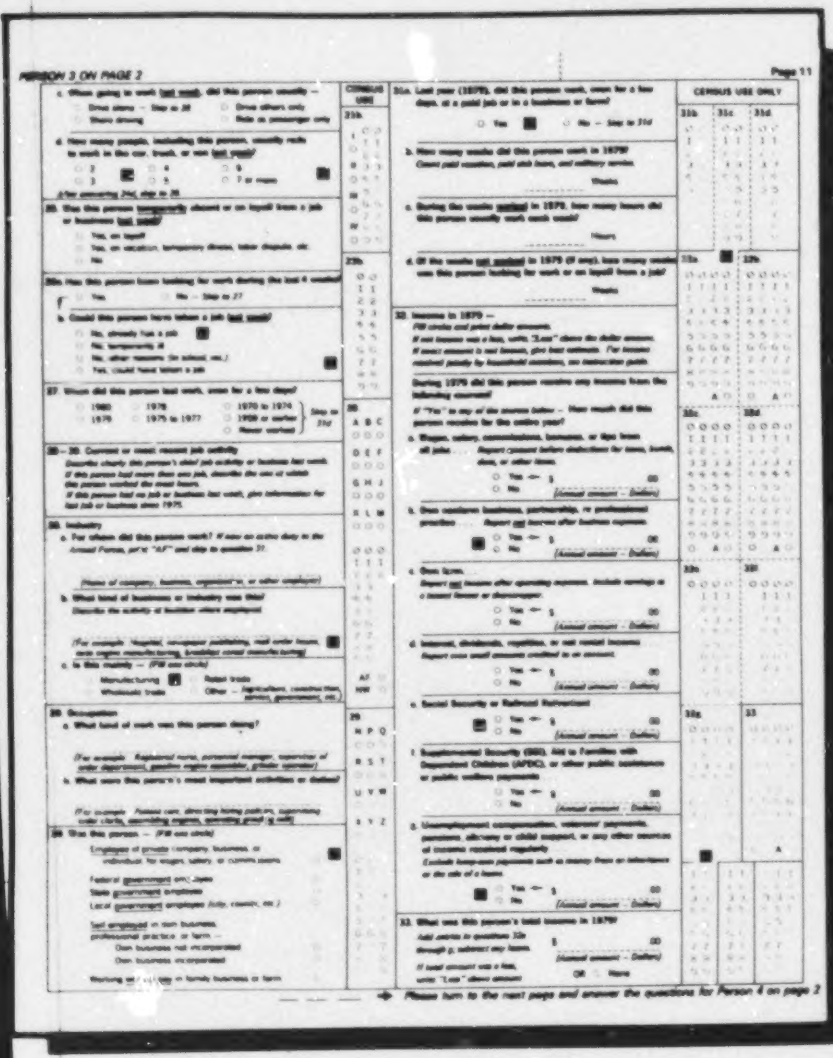
Per No. 11 13b 14 15b 23 VL 24a



PERSON 3 ON PAGE 2

Page 11

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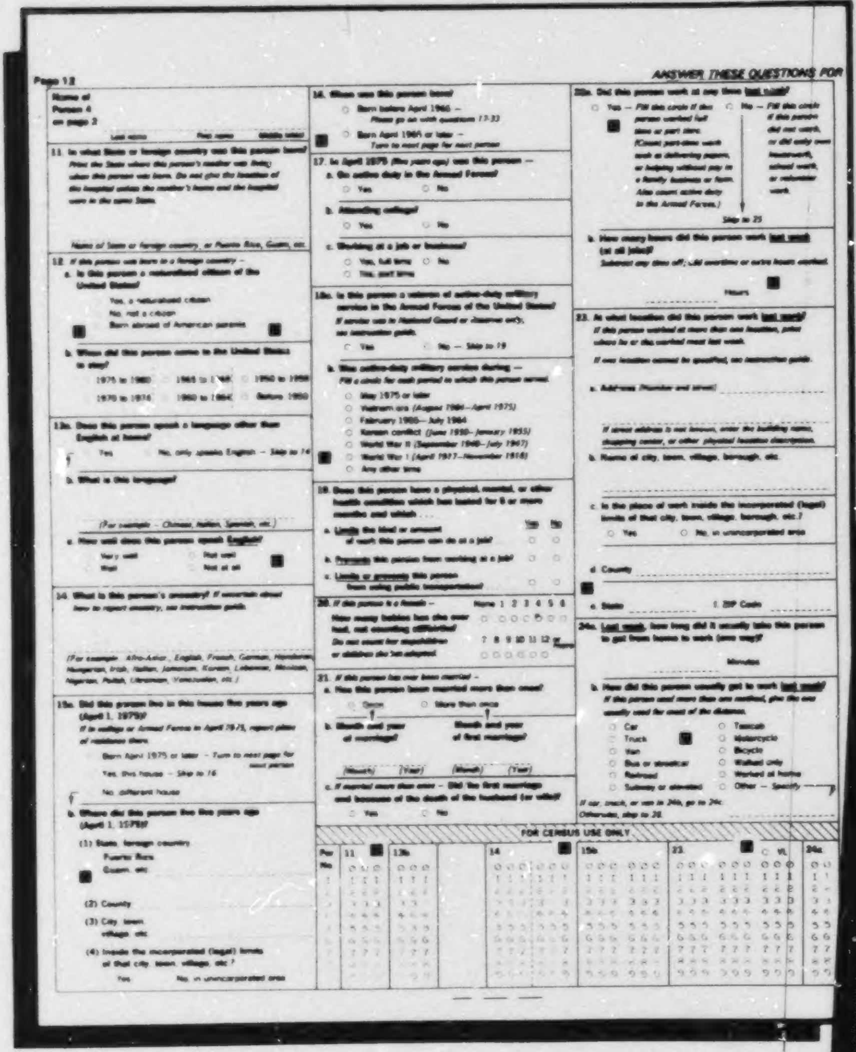

Page 12

ANSWER THESE QUESTIONS FOR

Name of Person 4 on page 2

Last name First name Middle initial

11. In what State or foreign country was this person born?
Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.

Name of State or foreign country, or Puerto Rico, Guam, etc.

12. *If this person was born in a foreign country —*
a. Is this person a naturalized citizen of the United States?
Yes, a naturalized citizen
No, not a citizen
Born abroad of American parents

b. When did this person come to the United States to stay?
1975 to 1980 1965 to 1969 1950 to 1959
1970 to 1974 1960 to 1964 Before 1950

13a. Does this person speak a language other than English at home?
Yes No, only speaks English — Skip to 14

b. What is this language?

(For example — Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?
Very well Not well
Well Not at all

14. What is this person's ancestry? *If uncertain about how to report ancestry, see instruction guide.*

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Yes, this house — Skip to 16
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(2) County
(3) City, town, village, etc.
(4) Inside the incorporated (legal) limits of that city, town, village, etc.?
Yes No, in unincorporated area

16. When was this person born?
○ Born before April 1965 — *Please go on with questions 17-33*
○ Born April 1965 or later — *Turn to next page for next person*

17. In April 1975 (five years ago) was this person —
a. On active duty in the Armed Forces?
○ Yes ○ No

b. Attending college?
○ Yes ○ No

c. Working at a job or business?
○ Yes, full time ○ No
○ Yes, part time

18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?
If service was in National Guard or Reserves only, see instruction guide.
○ Yes ○ No — Skip to 19

b. Was active-duty military service during —
Fill a circle for each period in which this person served.
○ May 1975 or later
○ Vietnam era *(August 1964—April 1975)*
○ February 1955—July 1964
○ Korean conflict *(June 1950—January 1955)*
○ World War II *(September 1940—July 1947)*
○ World War I *(April 1917—November 1918)*
○ Any other time

19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .

	Yes	No
a. Limits the kind or amount of work this person can do at a job?	○	○
b. Prevents this person from working at a job?	○	○
c. Limits or prevents this person from using public transportation?	○	○

20. *If this person is a female —*
How many babies has she ever had, not counting stillbirths?
Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6
○	○	○	○	○	○	○
7	8	9	10	11	12 or more	
○	○	○	○	○	○	

21. *If this person has ever been married —*
a. Has this person been married more than once?
○ Once ○ More than once

b. Month and year of marriage? Month and year of first marriage?

(Month) *(Year)* *(Month)* *(Year)*

c. *If married more than once* — Did the first marriage end because of the death of the husband (or wife)?
○ Yes ○ No

22a. Did this person work at any time last week?
○ Yes — *Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)*
○ No — *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.*
Skip to 25

b. How many hours did this person work last week (at all jobs)?
Subtract any time off; add overtime or extra hours worked.

Hours

23. At what location did this person work last week?
If this person worked at more than one location, print where he or she worked most last week.

If one location cannot be specified, see instruction guide.

a. Address (Number and street)

If street address is not known, enter the building name, shopping center, or other physical location description.

b. Name of city, town, village, borough, etc.

c. Is the place of work inside the incorporated (legal) limits of that city, town, village, borough, etc.?
○ Yes ○ No, in unincorporated area

d. County

e. State f. ZIP Code

24a. Last week, how long did it usually take this person to get from home to work (one way)?

Minutes

b. How did this person usually get to work last week?
If this person used more than one method, give the one usually used for most of the distance.
○ Car ○ Taxicab
○ Truck ○ Motorcycle
○ Van ○ Bicycle
○ Bus or streetcar ○ Walked only
○ Railroad ○ Worked at home
○ Subway or elevated ○ Other — Specify

If car, truck, or van in 24b, go to 24c.
Otherwise, skip to 28.

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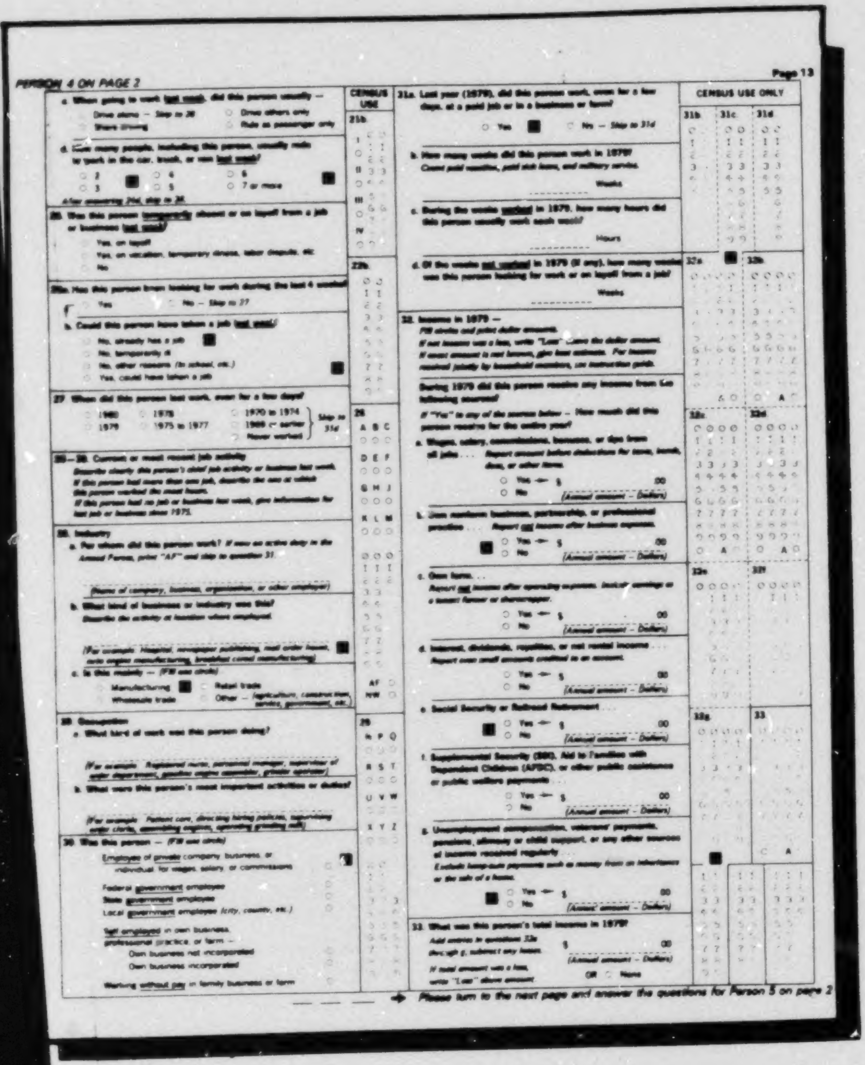
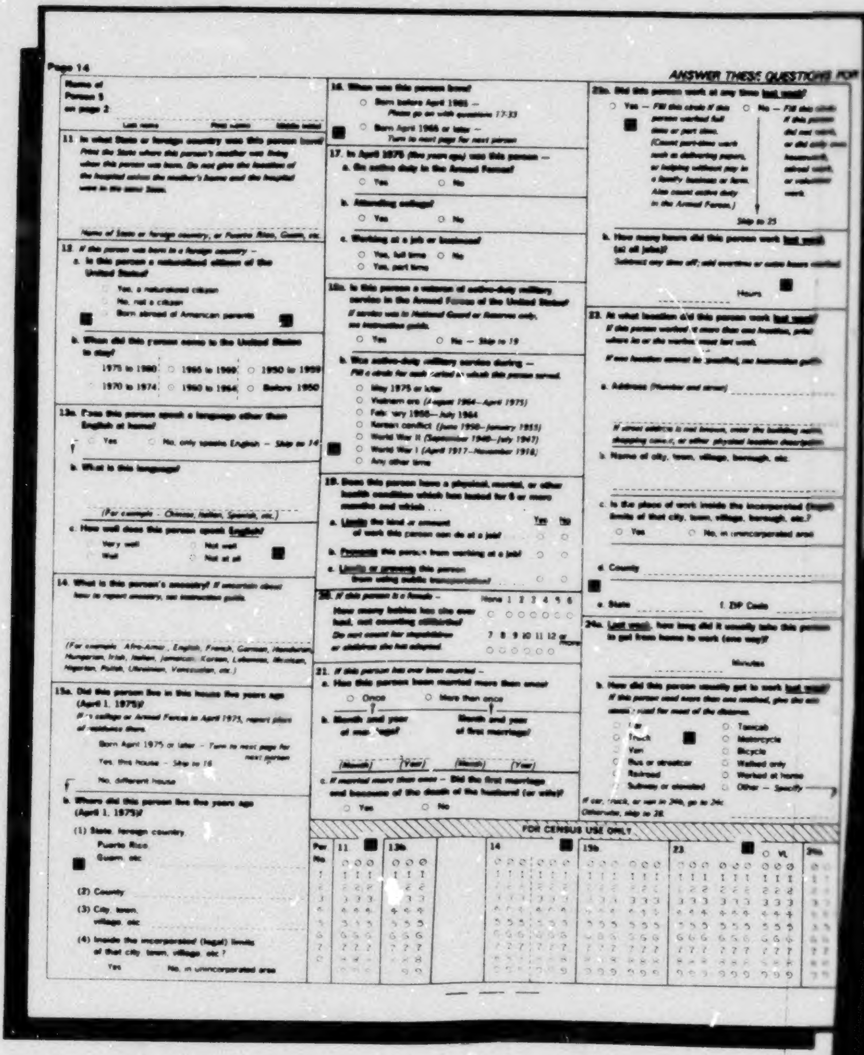
Per No. 11 13b 14 15b 23 VL 24a





Page 14

ANSWER THESE QUESTIONS FOR

Name of Person 5 on page 2:

Last name First name Middle initial

11. In what State or foreign country was this person born?
Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.

Name of State or foreign country, or Puerto Rico, Guam, etc.

12. *If this person was born in a foreign country —*
a. Is this person a naturalized citizen of the United States?
○ Yes, a naturalized citizen
○ No, not a citizen
○ Born abroad of American parents

b. When did this person come to the United States to stay?
○ 1975 to 1980 ○ 1965 to 1969 ○ 1950 to 1959
○ 1970 to 1974 ○ 1960 to 1964 ○ Before 1950

13a. Does this person speak a language other than English at home?
○ Yes ○ No, only speaks English — *Skip to 14*

b. What is this language?

(For example - Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?
○ Very well ○ Not well
○ Well ○ Not at all

14. What is this person's ancestry? *If uncertain about how to report ancestry, see instruction guide.*

(For example: Afro-Amer., English, French, German, Honduran, Hungarian, Irish, Italian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Polish, Ukrainian, Venezuelan, etc.)

15a. Did this person live in this house five years ago (April 1, 1975)?
If in college or Armed Forces in April 1975, report place of residence there.
○ Born April 1975 or later — *Turn to next page for next person*
○ Yes, this house — *Skip to 16*
○ No, different house

b. Where did this person live five years ago (April 1, 1975)?
(1) State, foreign country, Puerto Rico, Guam, etc.
(2) County
(3) City, town, village, etc.
(4) Inside the incorporated (legal) limits of that city, town, village, etc.?
○ Yes ○ No, in unincorporated area

16. When was this person born?
○ Born before April 1965 — *Please go on with questions 17-33*
○ Born April 1965 or later — *Turn to next page for next person*

17. In April 1975 (five years ago) was this person —
a. On active duty in the Armed Forces?
○ Yes ○ No
b. Attending college?
○ Yes ○ No
c. Working at a job or business?
○ Yes, full time ○ No
○ Yes, part time

18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?
If service was in National Guard or Reserves only, see instruction guide.
○ Yes ○ No — *Skip to 19*

b. Was active-duty military service during —
Fill a circle for each period in which this person served.
○ May 1975 or later
○ Vietnam era *(August 1964—April 1975)*
○ February 1955—July 1964
○ Korean conflict *(June 1950—January 1955)*
○ World War II *(September 1940—July 1947)*
○ World War I *(April 1917—November 1918)*
○ Any other time

19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .

	Yes	No
a. Limits the kind or amount of work this person can do at a job?	○	○
b. Prevents this person from working at a job?	○	○
c. Limits or prevents this person from using public transportation?	○	○

20. *If this person is a female —*
How many babies has she ever had, not counting stillbirths?
Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6
○	○	○	○	○	○	○
7	8	9	10	11	12 or more	
○	○	○	○	○	○	

21. *If this person has ever been married —*
a. Has this person been married more than once?
○ Once ○ More than once
b. Month and year of marriage? Month and year of first marriage?
(Month) (Year) (Month) (Year)
c. *If married more than once —* Did the first marriage end because of the death of the husband (or wife)?
○ Yes ○ No

22a. Did this person work at any time last week?
○ Yes — *Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)*
○ No — *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.* — *Skip to 25*

b. How many hours did this person work last week (at all jobs)?
Subtract any time off; add overtime or extra hours worked.
Hours

23. At what location did this person work last week?
If this person worked at more than one location, print where he or she worked most last week.
If one location cannot be specified, see instruction guide.
a. Address (Number and street)
If street address is not known, enter the building name, shopping center, or other physical location description.
b. Name of city, town, village, borough, etc.
c. Is the place of work inside the incorporated (legal) limits of that city, town, village, borough, etc.?
○ Yes ○ No, in unincorporated area
d. County
e. State f. ZIP Code

24a. Last week, how long did it usually take this person to get from home to work (one way)?
Minutes

b. How did this person usually get to work last week?
If this person used more than one method, give the one usually used for most of the distance.
○ Car ○ Taxicab
○ Truck ○ Motorcycle
○ Van ○ Bicycle
○ Bus or streetcar ○ Walked only
○ Railroad ○ Worked at home
○ Subway or elevated ○ Other — *Specify*

If car, truck, or van in 24b, go to 24c. Otherwise, skip to 28.

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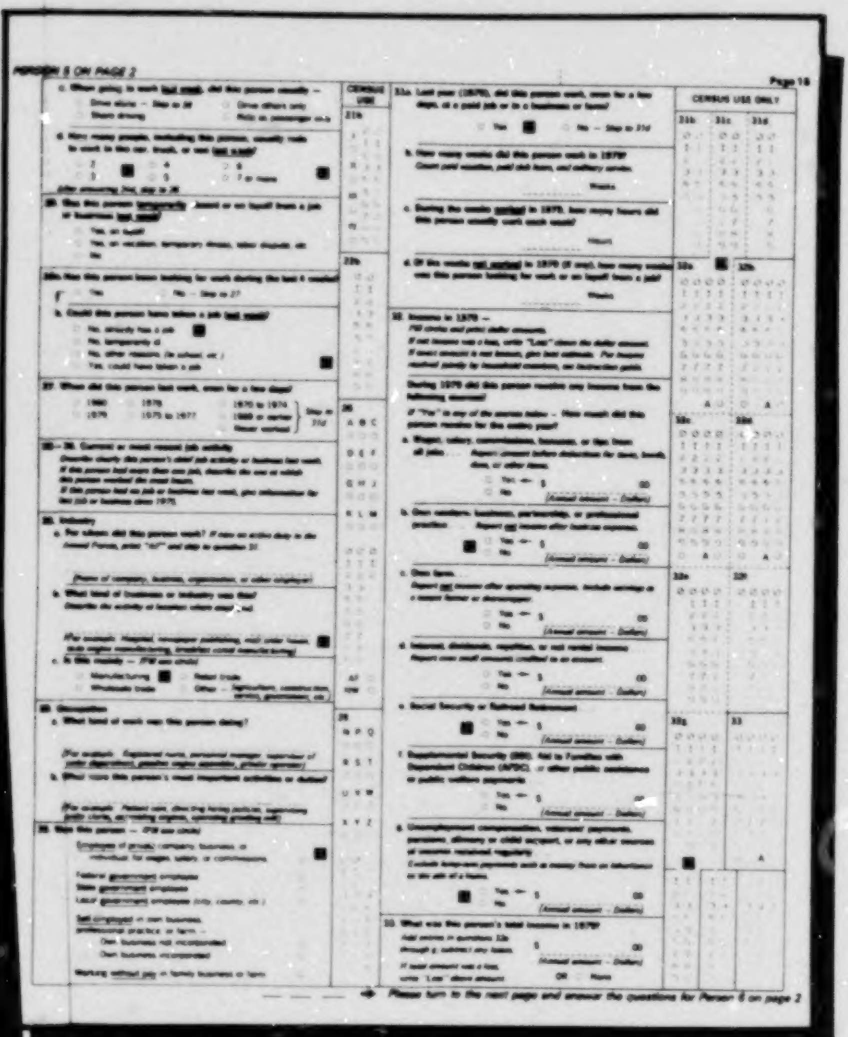

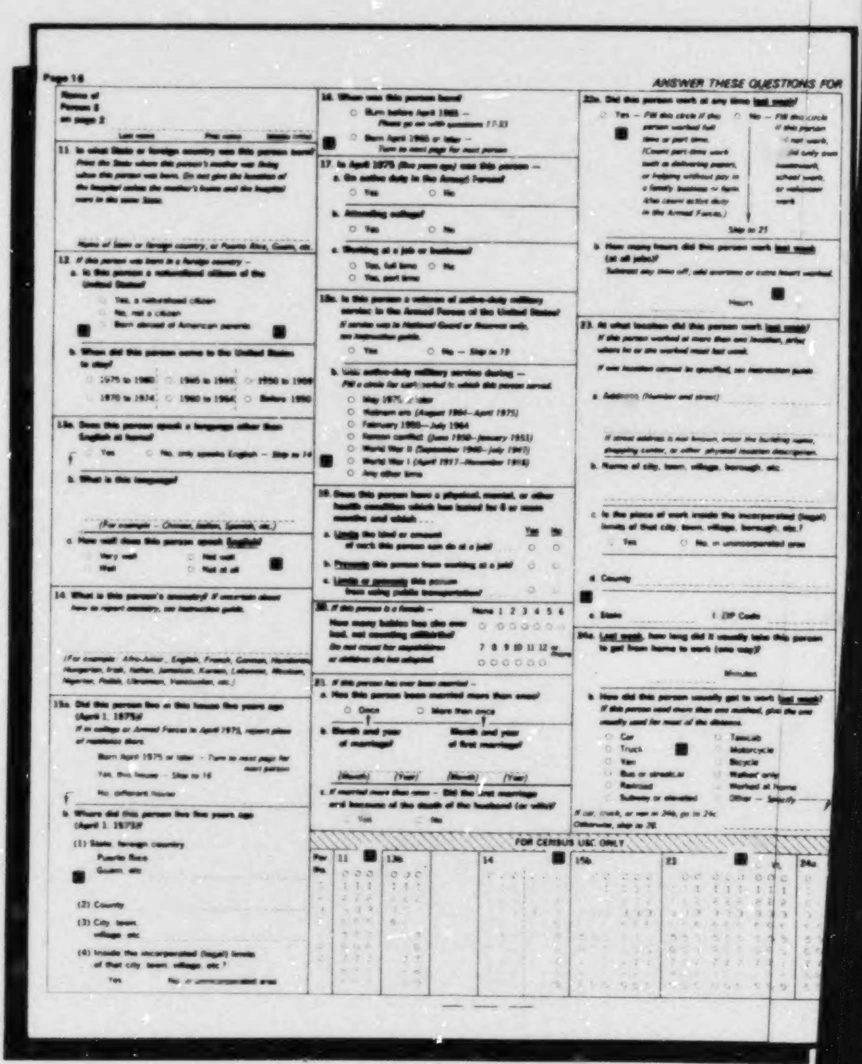

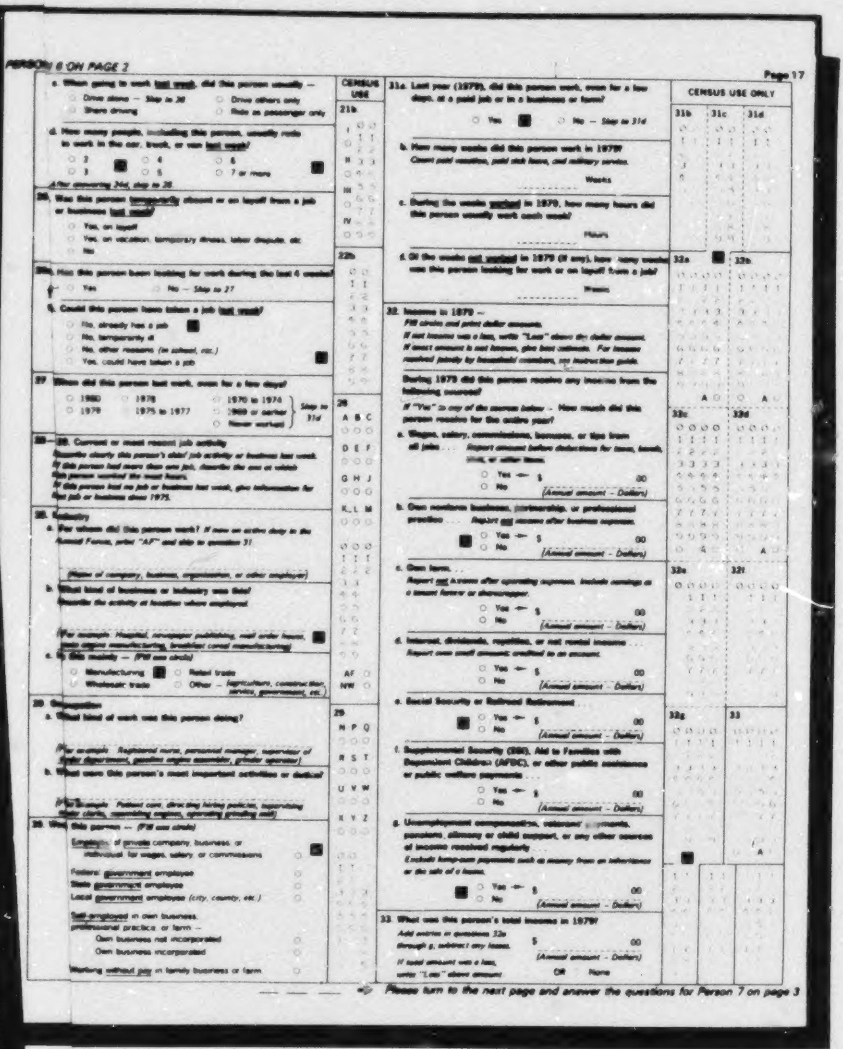

PERSON 6 ON PAGE 2

Page 17

c. When going to work last week, did this person usually —
○ Drive alone — Skip to 28
○ Drive others only
○ Share driving
○ Ride as passenger only

d. How many people, including this person, usually rode to work in the car, truck, or van last week?
○ 2 ○ 4 ○ 6
○ 3 ○ 5 ○ 7 or more

After answering 24d, skip to 28.

25. Was this person temporarily absent or on layoff from a job or business last week?
○ Yes, on layoff
○ Yes, on vacation, temporary illness, labor dispute, etc.
○ No

26a. Has this person been looking for work during the last 4 weeks?
○ Yes ○ No — Skip to 27

b. Could this person have taken a job last week?
○ No, already has a job
○ No, temporarily ill
○ No, other reasons (in school, etc.)
○ Yes, could have taken a job

27. When did this person last work, even for a few days?
○ 1980 ○ 1978 ○ 1970 to 1974
○ 1979 ○ 1975 to 1977 ○ 1969 or earlier
○ Never worked
} Skip to 31d

28–30. Current or most recent job activity
Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours.
If this person had no job or business last week, give information for last job or business since 1975.

28. Industry
a. For whom did this person work? If now on active duty in the Armed Forces, print "AF" and skip to question 31.

(Name of company, business, organization, or other employer)

b. What kind of business or industry was this?
Describe the activity at location where employed.

(For example: Hospital, newspaper publishing, mail order house, auto engine manufacturing, breakfast cereal manufacturing)

c. Is this mainly — (Fill one circle)
○ Manufacturing ○ Retail trade
○ Wholesale trade ○ Other — (agriculture, construction, service, government, etc.)

29. Occupation
a. What kind of work was this person doing?

(For example: Registered nurse, personnel manager, supervisor of order department, gasoline engine assembler, grinder operator)

b. What were this person's most important activities or duties?

(For example: Patient care, directing hiring policies, supervising order clerks, assembling engines, operating grinding mill)

30. Was this person — (Fill one circle)
Employee of private company, business, or individual, for wages, salary, or commissions ○
Federal government employee ○
State government employee ○
Local government employee (city, county, etc.) ○
Self-employed in own business, professional practice, or farm —
Own business not incorporated ○
Own business incorporated ○
Working without pay in family business or farm ○

31a. Last year (1979), did this person work, even for a few days, at a paid job or in a business or farm?
○ Yes ○ No — Skip to 31d

b. How many weeks did this person work in 1979?
Count paid vacation, paid sick leave, and military service.
Weeks

c. During the weeks worked in 1979, how many hours did this person usually work each week?
Hours

d. Of the weeks not worked in 1979 (if any), how many weeks was this person looking for work or on layoff from a job?
Weeks

32. Income in 1979 —
Fill circles and print dollar amounts.
If net income was a loss, write "Loss" above the dollar amount.
If exact amount is not known, give best estimate. For income received jointly by household members, see instruction guide.

During 1979 did this person receive any income from the following sources?

If "Yes" to any of the sources below — How much did this person receive for the entire year?

a. Wages, salary, commissions, bonuses, or tips from all jobs . . . Report amount before deductions for taxes, bonds, dues, or other items.
○ Yes → $ .00
○ No
(Annual amount – Dollars)

b. Own nonfarm business, partnership, or professional practice . . . Report net income after business expenses.
○ Yes → $ .00
○ No
(Annual amount – Dollars)

c. Own farm . . .
Report net income after operating expenses. Include earnings as a tenant farmer or sharecropper.
○ Yes → $ .00
○ No
(Annual amount – Dollars)

d. Interest, dividends, royalties, or net rental income . . .
Report even small amounts credited to an account.
○ Yes → $ .00
○ No
(Annual amount – Dollars)

e. Social Security or Railroad Retirement . . .
○ Yes → $ .00
○ No
(Annual amount – Dollars)

f. Supplemental Security (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments . . .
○ Yes → $ .00
○ No
(Annual amount – Dollars)

g. Unemployment compensation, veterans' payments, pensions, alimony or child support, or any other sources of income received regularly . . .
Exclude lump-sum payments such as money from an inheritance or the sale of a home.
○ Yes → $ .00
○ No
(Annual amount – Dollars)

33. What was this person's total income in 1979?
Add entries in questions 32a through g; subtract any losses.
If total amount was a loss, write "Loss" above amount.
$ .00
(Annual amount – Dollars)
OR ○ None

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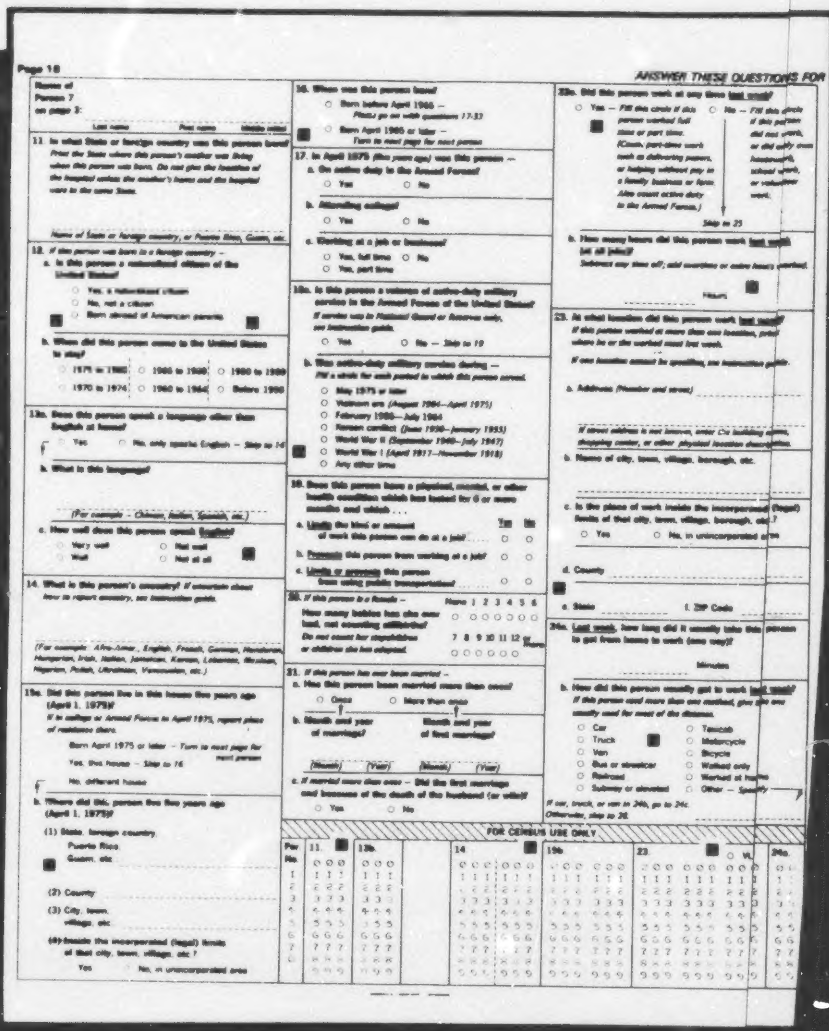
Please turn to the next page and answer the questions for Person 7 on page 3



Page 18

ANSWER THESE QUESTIONS FOR

Name of
Person 7
on page 2:

Last name ---- First name ---- Middle initial

11. In what State or foreign country was this person born?
Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.

Name of State or foreign country; or Puerto Rico, Guam, etc.

12. *If this person was born in a foreign country —*

a. Is this person a naturalized citizen of the United States?

○ Yes, a naturalized citizen
○ No, not a citizen
○ Born abroad of American parents

b. When did this person come to the United States to stay?

○ 1975 to 1980	○ 1965 to 1969	○ 1950 to 1959
○ 1970 to 1974	○ 1960 to 1964	○ Before 1950

13a. Does this person speak a language other than English at home?
○ Yes ○ No, only speaks English — *Skip to 14*

b. What is this language?

(For example — Chinese, Italian, Spanish, etc.)

c. How well does this person speak English?
○ Very well ○ Not well
○ Well ○ Not at all

14. What is this person's ancestry? *If uncertain about how to report ancestry, see instruction guide.*

(For example: Afro-Amer., English, French, German, Honduran, Hungarian, Irish, Italian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Polish, Ukrainian, Venezuelan, etc.)

15a. Did this person live in this house five years ago (April 1, 1975)?
If in college or Armed Forces in April 1975, report place of residence there.

Born April 1975 or later — *Turn to next page for next person*
Yes, this house — *Skip to 16*
No, different house

b. Where did this person live five years ago (April 1, 1975)?

(1) State, foreign country, Puerto Rico, Guam, etc.

(2) County

(3) City, town, village, etc.

(4) Inside the incorporated (legal) limits of that city, town, village, etc.?
Yes ○ No, in unincorporated area

16. When was this person born?
○ Born before April 1965 — *Please go on with questions 17-33*
○ Born April 1965 or later — *Turn to next page for next person*

17. In April 1975 (five years ago) was this person —

a. On active duty in the Armed Forces?
○ Yes ○ No

b. Attending college?
○ Yes ○ No

c. Working at a job or business?
○ Yes, full time ○ No
○ Yes, part time

18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?
If service was in National Guard or Reserves only, see instruction guide.
○ Yes ○ No — *Skip to 19*

b. Was active-duty military service during —
Fill a circle for each period in which this person served.

○ May 1975 or later
○ Vietnam era *(August 1964—April 1975)*
○ February 1955—July 1964
○ Korean conflict *(June 1950—January 1955)*
○ World War II *(September 1940—July 1947)*
○ World War I *(April 1917—November 1918)*
○ Any other time

19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .

	Yes	No
a. Limits the kind or amount of work this person can do at a job?	○	○
b. Prevents this person from working at a job?	○	○
c. Limits or prevents this person from using public transportation?	○	○

20. *If this person is a female —*
How many babies has she ever had, not counting stillbirths?
Do not count her stepchildren or children she has adopted.

None	1	2	3	4	5	6
○	○	○	○	○	○	○

7	8	9	10	11	12 or more
○	○	○	○	○	○

21. *If this person has ever been married —*

a. Has this person been married more than once?
○ Once ○ More than once

b. Month and year of marriage? **Month and year of first marriage?**

(Month) (Year) (Month) (Year)

c. *If married more than once —* **Did the first marriage end because of the death of the husband (or wife)?**
○ Yes ○ No

22a. Did this person work at any time last week?
○ Yes — *Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)*
○ No — *Fill this circle if this person did not work, or did only own housework, school work, or volunteer work.* *Skip to 25*

b. How many hours did this person work last week (at all jobs)?
Subtract any time off; add overtime or extra hours worked.

Hours

23. At what location did this person work last week?
If this person worked at more than one location, print where he or she worked most last week.
If one location cannot be specified, see instruction guide.

a. Address *(Number and street)*

If street address is not known, enter the building name, shopping center, or other physical location description.

b. Name of city, town, village, borough, etc.

c. Is the place of work inside the incorporated (legal) limits of that city, town, village, borough, etc.?
○ Yes ○ No, in unincorporated area

d. County

e. State **f. ZIP Code**

24a. Last week, how long did it usually take this person to get from home to work (one way)?

Minutes

b. How did this person usually get to work last week?
If this person used more than one method, give the one usually used for most of the distance.

○ Car ○ Taxicab
○ Truck ○ Motorcycle
○ Van ○ Bicycle
○ Bus or streetcar ○ Walked only
○ Railroad ○ Worked at home
○ Subway or elevated ○ Other — *Specify*

If car, truck, or van in 24b, go to 24c. Otherwise, skip to 28.

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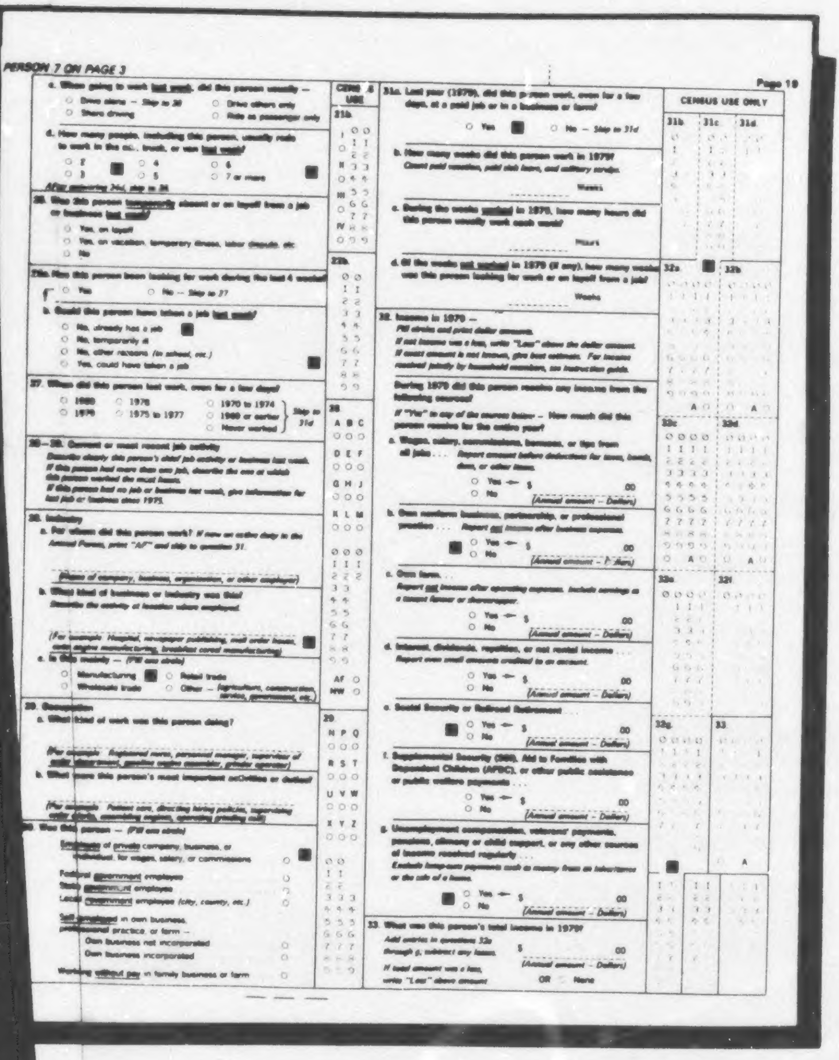
Per No. | 11. | 13b. | 14 | 19b | 23 | ○ VL | 24a.



PERSON 7 ON PAGE 3

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c. When going to work last week, did this person usually —
○ Drive alone — *Skip to 28*
○ Share driving
○ Drive others only
○ Ride as passenger only

d. How many people, including this person, usually rode to work in the car, truck, or van last week?
○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 or more

After answering 24d, skip to 28.

25. Was this person temporarily absent or on layoff from a job or business last week?
○ Yes, on layoff
○ Yes, on vacation, temporary illness, labor dispute, etc.
○ No

26a. Has this person been looking for work during the last 4 weeks?
○ Yes ○ No — *Skip to 27*

b. Could this person have taken a job last week?
○ No, already has a job
○ No, temporarily ill
○ No, other reasons *(in school, etc.)*
○ Yes, could have taken a job

27. When did this person last work, even for a few days?
○ 1980 ○ 1979 ○ 1978 ○ 1975 to 1977
○ 1970 to 1974
○ 1969 or earlier
○ Never worked
} *Skip to 31d*

28–30. Current or most recent job activity
Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give information for last job or business since 1975.

28. Industry
a. For whom did this person work? *If now on active duty in the Armed Forces, print "AF" and skip to question 31.*
(Name of company, business, organization, or other employer)

b. What kind of business or industry was this?
Describe the activity at location where employed.
(For example: Hospital, newspaper publishing, mail order house, auto engine manufacturing, breakfast cereal manufacturing)

c. Is this mainly — *(Fill one circle)*
○ Manufacturing ○ Retail trade
○ Wholesale trade ○ Other — *(agriculture, construction, service, government, etc.)*

29. Occupation
a. What kind of work was this person doing?
(For example: Registered nurse, personnel manager, supervisor of order department, gasoline engine assembler, grinder operator)

b. What were this person's most important activities or duties?
(For example: Patient care, directing hiring policies, supervising order clerks, assembling engines, operating grinding mill)

30. Was this person — *(Fill one circle)*
Employee of private company, business, or individual, for wages, salary, or commissions ○
Federal government employee ○
State government employee ○
Local government employee *(city, county, etc.)* ○
Self-employed in own business, professional practice, or farm —
Own business not incorporated ○
Own business incorporated ○
Working without pay in family business or farm ○

CENSUS USE

31a. Last year (1979), did this person work, even for a few days, at a paid job or in a business or farm?
○ Yes ○ No — *Skip to 31d*

b. How many weeks did this person work in 1979?
Count paid vacation, paid sick leave, and military service.
Weeks

c. During the weeks worked in 1979, how many hours did this person usually work each week?
Hours

d. Of the weeks not worked in 1979 (if any), how many weeks was this person looking for work or on layoff from a job?
Weeks

32. Income in 1979 —
Fill circles and print dollar amounts.
If net income was a loss, write "Loss" above the dollar amount.
If exact amount is not known, give best estimate. For income received jointly by household members, see instruction guide.

During 1979 did this person receive any income from the following sources?

If "Yes" to any of the sources below — How much did this person receive for the entire year?

a. Wages, salary, commissions, bonuses, or tips from all jobs . . . *Report amount before deductions for taxes, bonds, dues, or other items.*
○ Yes → $ .00
○ No
(Annual amount — Dollars)

b. Own nonfarm business, partnership, or professional practice . . . *Report net income after business expenses.*
○ Yes → $ .00
○ No
(Annual amount — Dollars)

c. Own farm . . .
Report net income after operating expenses. Include earnings as a tenant farmer or sharecropper.
○ Yes → $ .00
○ No
(Annual amount — Dollars)

d. Interest, dividends, royalties, or net rental income . . .
Report even small amounts credited to an account.
○ Yes → $ .00
○ No
(Annual amount — Dollars)

e. Social Security or Railroad Retirement . . .
○ Yes → $ .00
○ No
(Annual amount — Dollars)

f. Supplemental Security (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments . . .
○ Yes → $ .00
○ No
(Annual amount — Dollars)

g. Unemployment compensation, veterans' payments, pensions, alimony or child support, or any other sources of income received regularly . . .
Exclude lump-sum payments such as money from an inheritance or the sale of a home.
○ Yes → $ .00
○ No
(Annual amount — Dollars)

33. What was this person's total income in 1979?
Add entries in questions 32a through g; subtract any losses.
If total amount was a loss, write "Loss" above amount.
$ .00
(Annual amount — Dollars)
OR ○ None

CENSUS USE ONLY

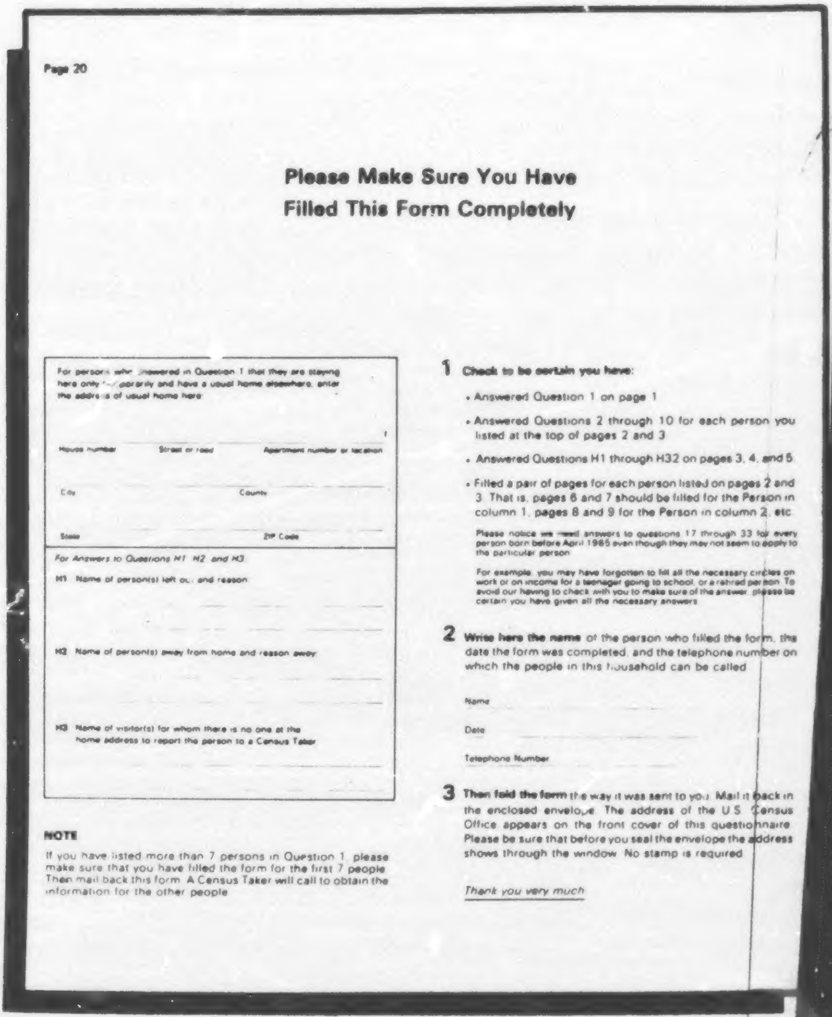
31b 31c 31d

32a 32b

32c 32d

32e 32f

32g 33



Page 20

Please Make Sure You Have Filled This Form Completely

For persons who answered in Question 1 that they are staying here only temporarily and have a usual home elsewhere, enter the address of usual home here:

House number

Street or road

Apartment number or location

City

County

State

ZIP Code

For Answers to Questions H1 H2 and H3

H1 Name of person(s) left out and reason

H2 Name of person(s) away from home and reason away

H3 Name of visitor(s) for whom there is no one at the home address to report the person to a Census Taker

NOTE

If you have listed more than 7 persons in Question 1 please make sure that you have filled the form for the first 7 people Then mail back this form A Census Taker will call to obtain the information for the other people

1 **Check to be certain you have:**

- Answered Question 1 on page 1
- Answered Questions 2 through 10 for each person you listed at the top of pages 2 and 3
- Answered Questions H1 through H32 on pages 3, 4, and 5
- Filled a pair of pages for each person listed on pages 2 and 3 That is, pages 6 and 7 should be filled for the Person in column 1, pages 8 and 9 for the Person in column 2, etc

Please notice we need answers to questions 17 through 33 for every person born before April 1965 even though they may not seem to apply to the particular person

For example, you may have forgotten to fill all the necessary circles on work or on income for a teenager going to school, or a retired person To avoid our having to check with you to make sure of the answer, please be certain you have given all the necessary answers

2 **Write here the name** of the person who filled the form, the date the form was completed, and the telephone number on which the people in this household can be called

Name

Date

Telephone Number

3 **Then fold the form** the way it was sent to you Mail it back in the enclosed envelope The address of the U.S. Census Office appears on the front cover of this questionnaire Please be sure that before you seal the envelope the address shows through the window No stamp is required

Thank you very much

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